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THE UNIVERSITY OF ALBERTA

ATTITUDES TOWARD ADOLESCENT PREGNANCY AND PARENTHOOD

by

ELAINE MARGARET KRYZANOWSKI

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

FALL, 1988

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled ATTITUDES TOWARD ADOLESCENT PREGNANCY AND PARENTHOOD submitted by ELAINE MARGARET KRYZANOWSKI in partial fulfilment of the requirements for the degree of DOCTOR OF PHILOSOPHY.

Supervisor

External Examiner

Date: October 12, 1988

Dedication

To the Philosopher's Stone and to Len,

with deep appreciation for their enriching presence in my life.

Abstract

That adolescent pregnancy is an escalating problem in North America cannot be disputed and the recent efflux of research and programming emanates from this recognition. It has been well documented that the pregnant adolescent faces a difficult future, at least socially and emotionally, and the potential risks to the child are significant. The literature reveals a lack of understanding, on the part of the teenager, of the demands and risks of early childbearing. In addition, it has been found that the vast majority of teenage pregnancies are unintended. This dissertation is a descriptive study designed to investigate the nature of female adolescents' attitudes toward teenage pregnancy and parenthood and the relationship between these attitudes and the following variables: cognition, age, sexual knowledge, sexual behavior, and experience with teen pregnancy and parenting.

Questionnaires were administered to 330 females in Grades 9-11 in attendance at public schools in Grande Prairie, Alberta. Attitudes toward pregnancy and parenthood were found to be negative, the majority of subjects demonstrated a concrete understanding of the issues involved, and gaps were exhibited with regard to sexual knowledge. Both sexual behavior and knowledge of a pregnant or parenting teen had a significant influence on attitudes.

The results of the study reveal the need for more exploratory research, greater public awareness of the nature and extent of the problem, increased focus in the direction of preventive programming, and the provision/continuation of counseling services for adolescents and their support systems.

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I. INTRODUCTION

The dissertation is a descriptive study designed to investigate the nature of female adolescents' attitudes toward adolescent pregnancy and parenthood and the relationship between these attitudes and the following variables: cognition, age, sexual knowledge, sexual behavior, and experience with pregnancy and parenthood. The rationale, research questions, and an overview of the study are as follows.

A. Rationale for the Study

It is estimated that approximately 50,000 to 55,000 girls between the ages of 15 and 19 become pregnant each year in Canada (Planned Parenthood Federation of Canada, 1980). Research has shown that the medical and social-emotional consequences of adolescent pregnancy and parenthood are numerous (Alberta Medical Association, 1980; DeWaal, 1982; Phipps-Yonas, 1980; Planned Parenthood Federation of Canada, 1980). Many of the medical problems can be avoided if good prenatal care and nutrition are provided. However, the social and emotional consequences are not easily alleviated. Phipps-Yonas (1980) explained that while there is no single pregnant teenager profile, it is well established that many face futures marked by instability and failure. It is not clear, however, whether "their subsequent problems are consequences of their early childbearing; they may simply represent correlates, later components of patterns set down long before the pregnancies occurred" (pp. 419-420).

According to Phipps-Yonas (1980), there are three possible stages of intervention in terms of program implementation. The first stage, primary prevention, involves presenting adolescents with sex education.

This is the stage at which "we have perhaps failed most miserably" (p. 421), despite young people's continual pleas for information. The second stage, secondary prevention, is concerned with abortion or adoption. The final stage for intervention involves providing assistance and training to those girls who choose to keep and raise their babies.

In terms of primary prevention, many writers, including McArnaney and Thiede (1981), Phipps-Yonas (1980), and Powell (1974), emphasize the need for more information about sex and contraception. McArnaney and Thiede, for example, stated that "the ideal, from the medical and public perspectives, is to prevent adolescent pregnancies through improved utilization of contraceptive services among adolescents" (p. 100).

Oettinger (1979) agreed that an effective preventive program would need to include more information about sex. In her words: "It is vital to see that children learn to make responsible sex decisions and that the battle be joined in by the schools" (p. 114). Additionally, however, she stressed the need for teaching moral responsibility (through critical evaluation of media messages and involvement in religion), peer counseling, and innovative programs tailored to teens. She described one program which involved junior- and senior-high school students participating in a "pseudoparenting" program. Students were required to work with young children and the program was aimed at providing awareness of the pleasures and responsibilities involved in bringing a child into the world. The program was described as effective in changing teens' attitudes.

According to Oettinger, the essential ingredient is the examination of values. It is suggested that "parents can play a vital role by supporting the adolescent's higher values while pointing out how

irresponsible sexual activities may hinder the younger person's ability to realize his life goals" (p. 161).

It is also the position of the Alberta Medical Association (1980) that teenage pregnancies are a growing medical and public health concern. Along with recommendations for more family life and birth control information in the schools, and more contraceptive counseling by the medical profession, they emphasized the potential role of the media in effecting attitude change. They suggested that there are two ways to counteract the barrage of sex information presented by the mass media (television, radio, music): to attempt to change attitudes toward responsible sexuality, and to provide sex and contraceptive education as well as more access to physicians and counseling professionals. Regarding the former approach, it has been well documented that the advertising media have been successful at directing teenage attitudes.

The role of peers in influencing adolescents is stressed and the following is explained: "Commercially much money is made from manipulating this fact and it is logical to use this knowledge for the benefit of these young people by hiring competent people to produce an attitude changing program slanted towards responsible sexuality" (p. 1). Thus, the Alberta Medical Association advocated that the media have tremendous potential for influencing attitudes and that this potential could be capitalized upon as a preventive approach to teenage pregnancy.

One of the more comprehensive programs designed to change adolescents' attitudes has been developed, implemented, and evaluated by the Alberta Alcohol and Drug Abuse Commission (AADAC). It was in 1981 that AADAC launched a major mass-media based alcohol moderation program aimed at increasing adolescents' awareness regarding the following: peer

influence on behavior, the modelling process, successful social interaction, and responsible independence. In 1981 the results of a household survey of attitudes and behaviors of Alberta teens and their parents were compared with results of a similar survey of teens in Manitoba. Manitoba teens were selected for comparison purposes because of the province's similarity to Alberta (both are prairie provinces) and because it was not planning a similar program. A program evaluation in 1983 revealed that some changes in attitudes and behaviors, consistent with the program objectives, had occurred in Alberta but not in Manitoba. According to Nutter and Skirrow, because these changes occurred concurrent with the program in Alberta and did not occur in Manitoba, "it is reasonable to assume that the changes were caused, at least in part, by the program" (1984, p. 10).

Thus, research has shown that the pregnant adolescent faces a difficult future, at least socially and emotionally, and the literature reveals a lack of understanding, on the part of the teenager, of the demands of early childbearing. Walters, McKenry, and Walters (1979) explained the Adolescent Pregnancy Project conducted at the University of Georgia. They described adolescents as having insufficient knowledge of the medical, psychological, and social risks associated with early childbearing, and recommended that better education and services be provided. In another research project, Foster (1981) conducted intensive interviews with 127 adolescent mothers and found that the girls generally agreed about the ways in which motherhood had changed their lives. Two recurring themes were that "having a child had made them grow up fast, and taking on full responsibility for a child had been hard" (p. 64). The majority of the girls regretted having become mothers at

such a young age and many explained that they just did not think about the possible consequences of irresponsible sexual behavior.

The present writer agrees with Oettinger (1979) and the Alberta Medical Association (1980) that a preventive program needs to be aimed at awareness and values clarification, not just the presentation of factual information and contraceptives. According to Oettinger: "Apparently many of our teenagers are keeping their options open, have constructive plans for the future - and with a little help from us - will find their way along their chosen path" (p. 162).

It is proposed here that such an attitude change approach could be developed as a preventive measure regarding teenage pregnancy and parenthood. However, in order to develop an attitude change program it is first necessary to assess the current attitudes of teens. In addition, because understanding the long-term consequences of teenage pregnancy and parenthood involves hypothetical and future-oriented cognitive skills, it is suggested that present level of cognitive functioning is a necessary consideration.

National and regional studies in the United States in 1978 determined that "for the most part, teenage pregnancies are reported as unintended" (Scott, 1983, p. 889). Consistently, fewer than one third of pregnancies were intended. Given the seriousness of "a mistake" for both the teen and potential child involved, it is suggested here that there are teens who, if they fully understood the conception process and the implications of pregnancy and possible parenthood, would be more responsible in their sexual practices.

Piaget's theory of cognitive development, however, would suggest that younger and older teens would differ in their abilities to

understand the potential long-term consequences of irresponsible sexual behavior. Adolescents who are cognitively functioning at a formal operational level should be more likely to understand the potential effects early parenthood would have on their lives, as opposed to concrete operational thinkers who would have difficulty imagining such a hypothetical, future-oriented, abstract idea.

Biggs and Collis (1982) modified Piaget's developmental stages and developed a means of qualitatively evaluating learning. Their technique, the SOLO (Structure of the Observed Learning Outcome) Taxonomy, emphasizes the evaluation of the quality of learning as demonstrated on a specific task. This differs from Piaget's focus on the attainment of developmental stages. According to their research, formal operational thought is not demonstrated before 16 years of age, if it is demonstrated at all.

B. Research Questions

With all of this is mind, the present study was designed to examine six questions. While some investigators have sought information about attitudes toward contraception and/or sexual behavior, no research has been located regarding attitudes toward pregnancy and parenthood and no research has been located which looks at attitudes in relation to levels of cognitive functioning. Thus, the first two questions are aimed at providing information in these areas. The following four questions were included in order to investigate the relationship between attitudes and some of the other mediating variables (cognition is also considered to be one of these variables) that Cooper and Croyle (1984) and Gagne (1985) stressed should be taken into account in a study of attitudes.

The six questions of interest are as follows:

1. What are adolescent females' attitudes toward teenage pregnancy and parenthood?
2. What is the relationship between attitudes and cognitive level of response as per questions scored according to the SOLO Taxonomy?
3. What is the relationship between attitudes and age?
4. What is the relationship between attitudes and sexual knowledge?
5. What is the relationship between attitudes and sexual behavior?
6. What is the relationship between attitudes and experience with teenage pregnancy and parenthood?

C. Overview of the Study

Chapter II contains a review of selected literature on the topics of adolescent pregnancy and parenthood, attitude theory, and cognitive development. Chapter III, the delineation of the methodology employed in the study, includes descriptions of the sample, the research instruments, the procedures for data collection and analysis, and the delimitations and limitations of the study. Because of the number and interrelatedness of the research questions, the results of the analyses and the discussion for each are presented consecutively in chapter IV rather than in separate chapters. It is suggested that this format will increase readability and thus increase meaningfulness for the reader. Some analyses additional to those outlined in the research questions are also described. Chapter V includes a summary of the most important findings, suggestions for further research, and concluding remarks.

II. REVIEW OF RELATED LITERATURE

Literature reviews of the following three major topics have been completed in preparation for this research: adolescent pregnancy and parenthood, attitude theory, and cognitive development. Because of the voluminous amount of literature published on each topic the reviews have, by necessity, been limited to only the most relevant aspects in relation to the questions under investigation. For further current information regarding adolescent sexuality/pregnancy/parenthood in Canada, the reader is referred to the following authors: Ajzenstat and Gentles (1988); Bibby and Posterski (1985); Caldwell (1987); Douglas-Crampton, Hestrin, and Lidstone (1985, February); Haave (1986); Herold (1984); "More Teen Girls" (1988); "Poor Babies" (1987); Scambler, Adler, and Congdon (1980); Swindlehurst (1986); Teen-Aid of Edmonton District Association (1988); and Weiden & Associates Ltd. (1987). Research on current issues in the United States is provided by the Center for Policy Research (1987) and Hayes (1987), and a progress report on the first statewide program dealing comprehensively with the issues of teenage pregnancy and parenthood, "Parents Too Soon," was prepared by the State of Illinois (1987).

A. Adolescent Pregnancy and Parenthood

Introduction

Teenage pregnancy has become a major concern in our society, and increasingly more research is being conducted on the topic and related issues. Chilman (1980) stated that until the late 1960's or early 1970's "there was virtually no social or psychological research on the sexual

development and behaviors of teenagers, with the teenagers being respondents" (p. 793). Also, prior to 1970 there were no systematic studies of the social and psychological consequences of adolescent childbearing. Research to date has focused on the incidence, causes, and medical and social/emotional consequences of early childbearing and parenthood.

Statistics

Rabkin (1979) reported that in Canada, in 1958, there were 6,301 babies born to unmarried girls between the ages of 15 and 19. By 1967 this number had increased to 11,775, and by 1976 the figure exceeded 19,000. During the same time period, Canada's total birthrate declined by nearly 45 per cent. According to the Planned Parenthood Federation of Canada (1980), teenagers between the ages of 15 and 19 average 50,000 to 55,000 pregnancies annually in Canada, and one-third of these pregnancies are terminated by abortion.

Interestingly, "the teenage birthrate is declining. A smaller proportion of teenagers are having babies today than at any time since the 1940's" (Planned Parenthood Federation of Canada, 1980, p. 3). However, because of the population bulge of teenagers, the numbers of pregnancies are not declining. Thus, although the rate of teenage pregnancy is declining, the absolute number is very high because there is an increase in the number of teenagers in the population. According to a fact sheet prepared for National Planned Parenthood Week 1980 (Planned Parenthood Federation of Canada, 1980), 1977 was the peak year for the 14- to 17-year-old population in Canada. This can be interpreted to mean that the number of 17- to 20-year-olds was at a peak in 1980.

For Alberta, the peak year for 12- to 17-year-olds was 1977. Thus, the number of 15- to 20-year-olds was at a peak in 1980.

Although the rate of teenage pregnancy is decreasing, more and more of those who do become pregnant are remaining single and keeping their infants (Planned Parenthood Federation of Canada, 1980). In Rabkin's (1979) opinion, the fact that young mothers are opting to keep their babies causes the "consequences of this teenage mother phenomenon" (p. 37) to become a serious issue. This is because adolescent mothers are ill-prepared emotionally and financially to cope with raising infants on their own.

The Planned Parenthood Federation of Canada (1980) compiled statistics from the teen clinic at the Hospital For Sick Children, Toronto, which showed that the average age at first pregnancy dropped from 16.5 years in 1975 to 15.5 years in 1979, and that about 16% of adolescent pregnancies occurred after the first instance of intercourse. Doctors at the clinic estimated that 85 per cent of sexually active teens use no form of birth control and that every week approximately 1,000 teens become pregnant in Canada.

Schlesinger (1980) reported that in Canada in 1978, 41.6% of boys and 18.6% of girls were sexually active. Of all girls between the ages of 15 and 19, 2.9% had babies, 1.6% had abortions, and 4.5% were pregnant. In 1979, 1 in 3 abortions performed were for teenagers, and more than half of these were for girls aged 17 or less.

According to Statistics Canada (1982a,b), in Canada in 1982 there were 281 babies born to girls 12-14 years of age, and 28,262 to girls 15-19 years of age. In Alberta, 41 babies were born to girls 13 and 14 years of age, and 4,537 to girls 15 to 19 years of age. Regarding

therapeutic abortions, 17,647 were performed in Canada on girls between the ages of 12 and 19 (16,900 were unmarried, and 1,679 were for girls under the age of 16). In Alberta, 1,886 were performed (1,759 were unmarried). A research project conducted by Alberta Education (1982) revealed that 13% of parents in the city of Edmonton were single parents, and that a significant proportion of them were teenage parents. In fact, one quarter of all the single Alberta mothers who gave birth in 1979 were under the age of 19. According to DeWaal (1982), nearly one third of Alberta teens reported having had sexual intercourse (17% at age 13, increasing to 67% by age 18), and on the average, no contraception was used for the first four months.

An extensive and highly influential report on pregnancy and sexually-transmitted diseases in Alberta teens entitled, "In Trouble . . . A Way Out," was prepared by Bonham, Clark, O'Malley, Nicholson, Ready, and Smith (1987) for the Alberta Community Health System. Statistics therein indicate that Alberta's teenage pregnancy rate is higher than the national average. In Alberta during 1986 there were 55 pregnancies per 1,000 females between 12 and 19 years of age. This rate is 37.5% higher than the national average of 40 pregnancies per 1,000 females in the same age range. According to Tretheway (1987), the Community Health Minister (J. Dinning) and the Assistant Deputy Minister in charge of Public Health (A. Murdock) both expressed alarm at these statistics. Dinning was shocked at the finding that 1 in 6 Alberta teenagers between 10 and 14 years of age was sexually active. Excerpts from the report are provided in the article entitled, "Sex Crisis in Teen-Age Alberta," from The Edmonton Journal (1987). In this article, it is revealed that between 40 and 50% of Alberta teenagers between the

ages of 14 and 18 years "are likely to be sexually active, ranging from 24% at age 14 to 66% at age 18" (p. B1).

A major problem, according to Murdock, is that there are no hard data that might explain this high incidence of pregnancy in the province (Tretheway, 1987). He speculated, however, that perhaps the frequency of sexual activity may not differ for Alberta's teens as opposed to the rest of Canada's teens, but that the pregnancies are the result of a lack of both information about and use of birth control. He stressed the urgent need to determine whether pregnancies are the result of choice or lack of information.

Also addressed in the report are social, birth control, educational, urban/rural, knowledge, and health considerations, as well as an Ontario family planning program shown to be successful at preventing adolescent pregnancies ("Sex Crisis," 1987). The following assessment of the situation is provided:

> We have given ignorance a fair chance and we are paying dearly. It is time for education. We cannot afford any other course. Clinical and educational programming has been demonstrated to significantly improve adolescent reproductive health. The committee agrees that we have a serious and, in many respects, a deteriorating problem. The solutions are not unknown. The costs of dealing effectively with the problems are less than the costs of coping with the consequencies. We cannot afford to do nothing. (p. B1)

Additional information regarding the report and its implications is provided by Ogle (1987), Sherlock (1987), and Moysa (1988).

Causes

Adolescents of both sexes are sexually maturing at an earlier age than was typical in the past. Currently, the average age for menarche is about 12±3 years (Anastasiow, 1983). According to the Planned Parenthood Federation of Canada (1980), studies in the United States have found that there is a correlation between age at menarche and age at first pregnancy. In comparison to girls with late menarche, girls with early menarche "are more than twice as likely to have had intercourse by age 16 and almost twice as likely to have given birth or had a pregnancy by age 18" (p. 6). The events may be linked by pubertal hormones leading to either increased libido or the development of secondary sex characteristics which attract males. Additionally, there is a correlation between early age at first intercourse and high risk of pregnancy. Primarily due to lack of use of contraceptives, girls at age 15 or under are nearly twice as likely to become pregnant during the first six months of sexual activity (compared to 18- or 19-year-olds).

National and regional studies in the United States in 1978 determined that "for the most part, teenage pregnancies are reported as unintended" (Scott, 1983, p. 889). Consistently, fewer than one third of pregnancies were intended. Why, then, do so many teenagers put themselves at risk?

Schneider (1982) wrote that pregnant adolescents tend to be viewed negatively by parents and health workers. The "old-wives tales" which evolved to explain adolescent pregnancies are categorized by Schneider as follows: the "bad seed" theory (the adolescent is inherently bad), the "geographical dislocation" theory (the adolescent is from the wrong side of the tracks), the "sexual appetite" theory (the adolescent is

oversexed and undercontrolled), and the "mental aberration" theory (the adolescent is mentally dull).

Many investigators have attempted to discover, based on research, rather than assumption, what causes teens to engage in high-pregnancy-risk behaviors. Guyatt (1974), for example, in a review of research involving more than 600 adolescent girls at the Family Planning Clinic in Scarborough, Ontario, explained seven general themes characteristically reported by pregnant teens. They are as follows: strong biological drive in adolescence which is spurred on by our society (especially the mass media), fantasy that it won't happen to them, realization that they are taking a risk but afraid to seek help (shy, fear of parents finding out, fear of refusal of assistance, fear of internal examination), failure of contraceptives, reluctance to use contraceptives (guilt, weight gain, parental discovery), desire to get pregnant (to have someone to love, to encourage marriage, to punish parents, romantic reasons, to fit in with the crowd), and finally, but rarely, because of rape.

Other investigators have explained teenage pregnancy as resulting from, for example, sentiments of love and aspirations for marriage (Scott, 1983), inadequate understanding of interpersonal relationships and contraceptives (Schneider, 1982), lack of contraceptive and reproductive information (Smith, Nenney, Weinman, & Mumford, 1982), poor self-concept and disordered behavior (Zongker, 1977), increased sexual activity in adolescents (Chilman, 1980), oedipal conflicts (Sugar, 1976), and inadequate parent-adolescent relationships (Landy, Schubert, Cleland, Clark, & Montgomery, 1983). That parents and peers play a critical role has been documented by Shah and Zelnik (1981). Oettinger

(1979) suggested that "the fact that society no longer frowns so universally on childbirth out-of-wedlock" (p. 12) is yet another reason for the increasing incidence of teenage pregnancy.

Phipps-Yonas (1980), following a review of the attempts to discover what causes teens to become pregnant, concluded that "the overriding message of their findings has been that there is no unique psychological profile common to most, much less all, pregnant adolescents" (p. 407). Thus, while a multitude of factors contribute to becoming pregnant, Phipps-Yonas concluded that the only universal factor that can be identified is that a biological union, an act of sexual intercourse, resulted in pregnancy.

Consequences

The Alberta Medical Association (1980), in a brief prepared for the Health and Social Services Caucus Committee, explained that through its Maternal Welfare and Perinatal Committees, it has "reason to share the deep concern of society at the outcome of the present attitudes of some teenagers to sexuality and the responsibilities of pregnancy and parenting" (p. 1). It is believed that "these teenagers present a growing health problem and are a source of considerable medical concern" (p. 1). It is explained that the Canadian Medical Association views teenage pregnancy problems as three-fold: increased health risk to the adolescent mother, increased infant morbidity and mortality, and the "pattern of lost educational opportunities, unstable family life and poor employability of the mother" (Appendix C).

Medical Implications

Numerous authors have written about the medical complications of teenage pregnancy. The following authors have elaborated on the potential risks involved: Alberta Medical Association (1980); Bartel (1981); DeWaal (1982); McArnaney and Thiede (1981); Oettinger (1979); Phipps-Yonas (1980); Planned Parenthood Federation of Canada (1980); Simkins (1984); and Stepto, Keith, and Keith (1975). Risks discussed include the following: high rates of anemia, toxemia, pre-eclampsia, urinary tract infections, uterine dysfunction, cephalopelvic disproportion, abruptio placenta, prematurity, prolonged labor, low birth weight, renal damage, vaginal infections, vaginal laceration, and heart disease. Also associated are high rates of fetal and perinatal mortality, morbidity, and maternal mortality.

While Bartel (1981) wrote that "clearly, many teenagers lack the physiological maturity they need to withstand the stresses of pregnancy" (p. 45), other authors are not clearly persuaded that age is the critical factor. Phipps-Yonas (1980), for example, said the following:

> These extremes are confounded by a number of the correlates of teenage childbearing, and thus it is difficult to determine the extent to which the high rates of pregnancy and birth complications reported for adolescents can be attributed to age per se. (p. 405)

She referred, for example, to other associated factors such as the quality of prenatal care and nutrition. Her review of the literature led her to conclude that although physiological and anatomical immaturity may contribute to problems in girls under the age of 15, the older teenager, with proper health care and nutrition, is medically ready to

become a mother.

The Planned Parenthood Federation of Canada (1980) stressed that the liklihood of complications during pregnancy can be minimized if the girl is healthy, receives proper nutrition, and has good medical attention. They emphasize, however, that very young girls do not have the physiological maturity to cope with the stresses that the body incurs during pregnancy.

Social/Emotional Implications

Associated with adolescent pregnancy and parenthood are a host of social and emotional difficulties. It is not known for sure whether these problems are caused by early childbearing or whether they are simply correlates, the continuation of patterns set down long before the pregnancies occurred (Phipps-Yonas, 1980). Teenage pregnancy has been associated with a lower level of educational attainment, less prestigious jobs, economic disadvantage, repeat pregnancies during adolescence, marital discord (Phipps-Yonas, 1980), and a poor self-concept (Friedenberg, 1986).

That teenage pregnancy is associated with a lower level of educational attainment has been well-documented (Card & Wise, 1978; Chilman, 1980; Ewer & Gibbs, 1976; McArnaney & Thiede, 1981; Phipps-Yonas, 1980; Planned Parenthood Federation of Canada, 1978). Phipps-Yonas explained that in the United States in 1980, 50-67% of female dropouts were pregnant. Most of these girls did not return to school to complete their education, especially if they kept their babies. Chilman (1980), however, in a review of the literature, wrote that half or more of dropouts return to school (often in middle age).

Card and Wise (1978) conducted a longitudinal nation-wide study of 375,000 males and females who were enrolled in Grades 9-12 in 1960. Three follow-up studies were conducted; 1, 5, and 11 years after the expected dates of high school graduation. It was found that independent of other influences, early pregnancy appeared to be the cause of unfinished schooling. Although the educational deficits of the fathers was not as great as that of the mothers, both had substantially less education than their classmates.

Lower levels of educational attainment tend to result in less prestigious jobs (Card & Wise, 1978; McArnaney & Thiede, 1981; Phipps-Yonas, 1980). Associated with reduced occupational attainment is lower income and less job satisfaction.

Not surprisingly, considering the discussion thus far, there is a tendency for the teenage childbearer to encounter economic difficulties and become, at least initially, dependent on welfare. Moore (1978), following a 2-year study of United States federal welfare expenditures, concluded the following:

> A woman who bears a child while in her teens is much more likely to be forced to support herself and her children on a low income or to become dependent on welfare assistance than the woman who postpones childbearing. (p. 233)

Society, as well as the individual teenager, is forced to feel the effects of early pregnancy. It was found that in 1975, one half of the government (United States) funding ($9.4 billion annually) for the Aid-to-Families-With-Dependent-Children category of the federal-state welfare program went to families where the mothers had their first children during their teenage years. The younger the mother (except

under age 15), the more likely welfare dependency was to result.

Freedman and Thornton (1979), following a 15-year longitudinal study in Detroit, found that the initial economic disadvantages associated with premarital childbearing, at least for couples who married prior to childbirth, were partially overcome in the long run. The couples in this sample (over 700) earned middle-class incomes, owned their own homes, and had some money saved. They did, however, have 22% less in total assets and more unplanned children than control couples who married and deferred parenthood.

Once-pregnant teenagers are at high risk to have subsequent pregnancies during the teenage years, and the younger the girl is at first pregnancy, the greater the liklihood she will become pregnant again (McArnaney & Thiede, 1981). Trussell and Menken (1978) found that teenage mothers "have children more rapidly, have more children, and more unwanted and out-of-wedlock births than women who postpone childbearing" (p. 209).

Early childbearing tends to be associated with later marital disruption (Chilman, 1980; Phipps-Yonas, 1980). According to Phipps-Yonas, the majority of teenage marriages result in permanent separation or divorce. Also at risk are the second marriages of teenage mothers.

Friedenberg (1986), for his doctoral dissertation, examined the self-concepts of ten unmarried adolescent mothers. The girls' accounts of motherhood, as revealed through interviews, were "seen as reflecting a need for self worth" (p. v).

It is apparent, then, that early childbearing and parenthood tend to be associated with negative social and emotional consequences. In the

words of Card and Wise (1978): "The repercussions of teenage childbearing are long-lasting" (p. 199).

Effects on the Children

Relevant empirical evidence is accumulating which consistently supports the claim that children born to teenage mothers suffer more physical, emotional, and intellectual handicaps (DeWaal, 1982; McArnaney & Thiede, 1981; Phipps-Yonas, 1980). Chilman (1980) elaborated on some of the discrepancies in the research, and McArnaney and Thiede (1981) referred to research emphasizing that the mother's age alone cannot be separated from the associated educational, economic, and marital consequences in determining the effects on children.

Conclusion

Despite the increased availability of contraceptives over the past 15 years, large numbers of teenage girls are becoming pregnant. Although increasingly more girls are carrying their babies to term and opting to raise their infants (as opposed to putting them up for adoption), still approximately one third of the pregnancies are terminated by abortion. Interestingly, although the national birthrate has declined, a population bulge of teenagers from 1977-1980 resulted in an increase in the numbers of babies being born to teenagers (Planned Parenthood Federation of Canada, 1980).

Many authors, including the Planned Parenthood Federation of Canada and the Alberta Medical Association (1980), have expressed concern about the causes and consequences (medical and social/emotional) of early childbearing and parenthood. It is the position of both of

these associations that preventive programs need to be instigated: that more sex education and contraceptives need to be made readily available to adolescents. The Alberta Medical Association also emphasizes the need for media-based programs aimed at attitude change in the direction of greater responsibility for sexuality. That the mass media, particularly television, should be used as a means of transmitting educational messages about birth control is also stressed by an official with Planned Parenthood Alberta ("TV Should Teach," 1987). According to this article, "a Gallup poll conducted for Planned Parenthood found that 75% of Canadians approve of educational messages on sexuality" (p. A11). Preventive approaches in terms of attitude change have been neglected, possibly because of the controversial nature of the topic, as well as the difficulty that their implementation and evaluation causes.

B. Attitudes

Introduction

Cooper and Croyle (1984) explained that while attitude formation and change has perhaps been the most actively researched topic in social psychology, interest has experienced both peaks and valleys. While the late 1960's and early 1970's witnessed one of these valleys, the late 1970's experienced a resurgence of interest. This revival has been accompanied by vast amounts of research.

The intention of the present author was a general examination of the past and current focuses of the attitude research. Following the definition of the term "attitude" is an explanation of the emergence of the theory beginning in 1930. The most current conceptualization of the nature of attitudes is described and a brief summary regarding the scope of attitudes is provided. Finally, three major approaches to attitude learning and change are discussed.

Because of the voluminous nature of the literature, the discussion of attitude measurement has been excluded from this review. Thus, what follows is an effort to elucidate the history and current emphases of the theoretical literature, although the review is nowhere near being comprehensive. Because some of the most influential and controversial research was conducted in the 1960's, several references which might otherwise be considered outdated have been included. In addition, however, is the explanation of more current trends.

Attitude Defined

According to Allport (1967), the concept of "attitude" is probably the most indispensable concept in contemporary social psychology. The term is popular in both experimental and theoretical literature for the following reasons: it is not tied to any one school of thought, it involves the recognition of the interaction of heredity and environment, and it can be used to refer to the dispositions of single individuals or broad patterns of culture. In Allport's words, "this useful, one might almost say peaceful, concept has been so widely adopted that it has virtually established itself as the keystone in the edifice of American social psychology" (p. 3). In fact, wrote Allport, several writers in the past have defined social psychology as the scientific study of attitudes. Because the term is abstract and its meaning indefinite, its scientific status has been questioned. However, said Allport, because the term is universally used, and because it plays a central role in many systematic studies in social psychology, it is a concept which must be examined with care.

According to Allport, (1967), the term "attitude" is abstract and has more than one meaning. It is a derivation of the Latin word aptus and is described as follows: "It has on the one hand the significance of 'fitness' or 'adaptedness,' and like its by-form 'aptitude' connotes a subjective or mental state of preparation for action" (p. 3). A second meaning developed in the field of art, where attitude was used to refer to the bodily position of a figure in a statue or painting. Both meanings have been preserved in modern psychology: the first in what have been called "mental attitudes" and the second in what are often referred to as "motor attitudes."

Because it reflects a body-mind dualism, this explicit dichotomous labelling has become uncommon in contemporary psychology. However, the term has implicitly retained both of its original meanings: a mental aptness and a motor set. In Allport's words, "attitude connotes a neuropsychic state of readiness for mental and physical activity" (p. 4). Gagne (1985) stressed that a particulary valuable definition which has withstood the test of time is the following more elaborate one offered by Allport in 1935: "An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (1967, p. 219). This definition makes clear the "readiness to respond" aspect of attitudes and emphasizes the role of learning in the establishment and organization of attitudes.

Consistent with the above conceptualization, Zimbardo and Ebbeson (1969, p. 6) explained that "attitudes have generally been regarded as either mental readinesses or implicit predispositions which exert some general and consistent influence on a fairly large class of evaluative responses," and are directed toward some object, person, or group. They are considered to be general, learned, and enduring (although they are susceptible to change).

According to Zimbardo and Ebbeson (1969), this definition is limited in that it implies that attitudes are internal states which affect behavior, but is ambiguous in regard to how this control is exerted. Thus, the concept of attitude has generally been subdivided to include the following three components: affect, cognition, behavior. The affective component has been conceptualized as "a person's evaluation of, liking of, or emotional response to some object or person" (p. 7).

The cognitive component involves "a person's beliefs about, or factual knowledge of, the object or person' (p. 7). Finally the behavioral component consists of "the person's overt behavior directed toward the object or person" (p. 7). It was believed that this conception of attitudes as involving three components suggests some methods of changing as well as measuring attitudes.

While the above conceptualization has been dominant, a second school of thought regarding the structural nature of attitudes was described by Severy (1974). Severy explained that while the conceptualization of attitudes in terms of components is comprehensive, it is also cumbersome. He described a second school of thought whose adherents consider attitudes to be merely evaluative (like/dislike) and to have a referent object.

The Emergence of Attitude Theory

Ostrom (1968) explained that the "two decades between 1930 and 1950 were marked by extensive empirical and theoretical study of attitude formation and change" (p. 1). He traced the development of this movement and explained the contributions of ten of the most influential theorists in the field during those years.

According to Ostrom, there were five major developments which led to the dramatic rise in the empirical and theoretical study of attitudes. First, laboratories for study in social psychology were established in the United States. Second, there was an increase in the number of students trained in empirical techniques and psychology theory. Third, in 1935, Allport integrated previously divergent usages of the term "attitude", distinguished it from other psychological

concepts, and established its study as a specialty in the field of social psychology. Fourth, techniques were developed by which attitudes could be measured, and finally, the fifth major influence was that attitudes were increasingly used as explanations for important social phenomena.

Between 1950 and 1968, according to Ostrom, there were at least 34 discrete contributions in the area; either attempts to isolate single processes or more broad-based conceptualizations. However, each falls into one or the other of two main categories of contributions: learning-behavior theory, and cognitive integration theory.

The first category, learning-behavior theory, subsumes those theories which emphasize the principles of learning theory. Included are, for example, theories which emphasize the following: mediated generalization, concept formation, conditioning, stimulus generalization, cognitive response, and behavioral disposition. The first four examples fall under the subcategory of "S-R" theories, and are described as corresponding to "applications of the mediating processes borrowed from specific learning-behavior theories" (p. 2). The subcategory of "eclectic" theories includes the other two examples, and corresponds to "theories which borrow empirical principles and apply them analogically to attitudinal responses" (p. 2).

The second main category, classified as cognitive integration theory, subsumes those contributions based on "analyses of the individual's phenomenal representation of his words" (p. 2). Included are three subcategories. The first, entitled "consistency", includes theories focusing on the processes of, for example, interpersonal orientation, congruity, and cognitive dissonance. The second

subcategory, "motivation", includes research regarding decisional conflict, self-evaluation, and belief congruence, for example. Finally, examples of the third subcategory, "nonmotivational", include belief dilemma resolution, adaptation level, and cognitive complexity.

Interestingly, a look at annual reviews of the literature on attitudes by Kiesler and Munson (1975), Cialdini, Petty, and Cacioppo (1981), and Cooper and Croyle (1984), revealed that the main categories of research outlined by Ostrom (1968) as being all inclusive several decades ago (learning-behavior theory, and cognitive integration theory), are highlighted in current research focusing on, for example, the relationship between attitude and behavior, attitude learning and change, and cognitive consistency.

Ostrom (1968) traced this growing body of literature through ten major contributors, beginning with Thurstone in 1928, and ending with Hovland in 1948-1949. Ostrom provided a detailed explanation of each contribution. Following, however, is only a brief consideration of the major points from each, as well as a general statement of some observable trends.

Ostrom explained that in 1928 Thurstone ended an unproductive debate when he wrote that attitudes were, in fact measureable. He described attitudes as multidimensional, and explained that they reflect the amount of affect for or against an attitude object.

It was in 1935 that Allport stressed that attitudes served the function of cognitive utility. He believed that their stereotype quality allowed for responses to classes of objects.

Lewin, in 1935, "attempted to integrate all the determinants of behavior under one dynamic, cognitive system" (Ostrom, 1968, p. 10), and

proposed that behavior is a joint function of the interaction of the person and the environment: B = f(P,E). According to this, for determinants of the person and environment to be potent, they must be perceived by the individual as being in the "life space". Lewin, then, emphasized that attitudes are personal and situational.

The importance of the interpersonal context in the development of attitudes was recognized by Newcomb in 1943. Newcomb believed that through adaptation to the social environment, the individual satisfies a need for personal security and recognition. The medium through which all factors influence attitudes was believed to be the individual's peers.

Sherif and Cantril, from 1945 to 1947, wrote about the importance of perceptual processes in attitude formation. Attitudes were considered to be representations of affective judgments in social situations.

In 1947, Smith defined attitudes as having three classes of measurement characteristics: "affective" (direction and intensity), "cognitive" (information context and time perspective), and "behavioral" (course of action). In addition, he believed that attitudes served the following five functions for the personality: expression of values, consistency of attitude and characteristic mode of reaction, basic needs' gratification, provision of meaning and predictability of the world, and finally, the facilitation of fulfillment of the basic need for acceptance and approval through conformity.

Also in 1947, the behaviorist orientation was expressed by Doob, who emphasized the behavior of attitudes. He viewed attitudes as anticipatory implicit responses which mediate overt responses, and stressed the importance of reinforcement in attitude formation.

The importance of the prestige of the communicator in influencing attitude change was recognized by Asch and his colleagues beginning in 1940. They challenged Thorndike's belief that communicator prestige and credibility influenced the acceptance of communication because the affective response to the communicator became associated with the message content. Asch saw this assumption as incomplete, and outlined the powerful potential of communicator prestige in its own right.

Heider, in 1946, with a Gestalt influence, provided an analysis of sentiments (attitudes) and how they belong together in the individual's life space. He emphasized the importance of cognitive balance: of cognitive elements being seen as belonging together as a "unit," based on the individual's perceptions of proximity, equality, and/or figure-ground relationship.

The final major contribution explained by Ostrom is that of Hovland, who, in 1948-1949, provided a detailed analysis of the following four facets of attitudinal responses: presence of learning ability, acceptance of the material communicated, interpretation of arguments, and the role of prior information. Particularly stressed is the importance of intelligence in this process. A second major area of contribution by Hovland was the application of the following principles of behavior theory to attitude learning: extinction, generalization, discrimination, temporal gradient of reward, and finally, reinforcement.

Interestingly, a careful look at these major contributions spanning the two decades from 1930 to 1950 reveals the emergence, in attitude research, of the following schools of thought: functionalist, Gestalt, behaviorist, social learning, and cognitivist. Additionally, an overall movement can be seen from viewing attitudes as primarily

affective to the more popular conceptualization as tri-componential; as having the following three dimensions: affective, cognitive, and behavioral.

Even with the emergence of such research, it was not until 1967 that this growing body of literature was professionally recognized as "attitude theory." Previously, Ostrom (1968) explained, this term had been reserved for more traditional areas of study such as perception, learning, cognition and motivation.

The Nature of Attitudes

There appears to be general agreement among authors that the most useful way to describe the nature of attitudes is in terms of three components: cognitive, affective, and behavioral (Gagne, 1985; Ostrom, 1968, 1969; Zimbardo & Ebbeson, 1969). While there exists evidence to support them all, the main differences among theories seem to focus on which of the three components is primary and determines the occurrence of the others. Following is a description of each component and some of the relevant related research. Because of the enormous amount of literature, the following focuses only on some of the more outstanding trends.

Cognitive Component

According to Gagne (1985), the cognitive component pertains to "the ideas or propositions that express the relation between situations and attitudinal objects (as in "automobiles use too much gasoline")" (p. 222). Most theories regarding this aspect of attitudes accept that the individual has a basic need for consistency among thoughts, beliefs,

attitudes, and behavior. Attitude change results, then, when inconsistency or dissonance is encountered.

Much of the research on cognitive consistency emanated from Heider's balance theory and Festinger's theory of cognitive dissonance (Cohen, 1967; McGuire, 1967). According to Kiesler and Munson (1975), most of the research regarding cognitive dissonance has focused on "discovering the critical variables underlying the forced compliance effect" (p. 425). This effect involves inducing subjects to perform an act inconsistent with personal beliefs to see if the inconsistency leads to an attitude change. Gagne (1985) reported one particularly well-known study in which "children were offered prizes for writing essays favoring a particular type of comic book, which they actually did not prefer" (p. 222). Following the receipt of the prizes, the children rated the comic books as more attractive than they had rated them before the essays were written.

Kiesler and Munson (1975) wrote that interest and excitement about dissonance theory is decreasing, and explained that less research is being conducted than in the past. In fact, they suggested that "the theory might be put on the endangered species list" (p. 425).

Interestingly, three literature reviews since that time (Cialdini et al., 1981; Cooper & Croyle, 1984; Eagly & Himmelfarb, 1978) have not reiterated this concern and instead devoted much of their reviews to explaining current trends.

Eagly and Himmelfarb (1978) noted that much of the current dissonance research supported the view that unwanted consequences after engaging in a behavior as well as personal responsibility for one's behavior are necessary conditions for attitude change to occur. They

also reviewed research on an alternative explanation for dissonance phenomena: Bem's theory of self-perception (one specific theory within the larger framework of attribution theory).

Bem (1967) suggested that much of the research on forced compliance in relation to dissonance theory could be explained alternatively. He proposed the following:

> An individual's belief and attitude statements and the beliefs and attitudes that an outside observer would attribute to him are often functionally equivalent in that both sets of statements are "inferences" from the same evidence: the public events that the socializing community originally employed in training the individual to make such self-descriptive statements. (p. 444)

This view is based largely on Skinner's analysis that social interaction results in the awareness and ability to respond differentially to one's own behavior. It is assumed that "the discriminative stimuli controlling the attitude statement reside in the individual's overt behavior" (p. 444), and that the individual's response is functionally equivalent to the response another person might give for him/her. Thus, wrote Eagly and Himmelfarb (1978), according to this theory, "the less the behavior appears to be under the control of situational stimuli such as reward or justification, the greater the inference that the behavior reflects the internal state or attitude" (p. 535).

In summarizing the research on Bem's position, Eagly and Himmelfarb found that the accumulated evidence suggested that self-inferences are based on internal and external cue information. They believed that Bem's approach underestimated the degree to which people

are aware of their internal states, attitudes, and past behaviors. A particularly good review of Bem's theory and the attendant controversy is provided by Shaw and Costanzo (1982).

Cialdini et al. (1981) explained some of the more general trends in the research on cognitive dissonance. They concluded that the theory appears to be thriving despite the emergence of opposing theories, and that "advocates of disconfirmable theories might be frustrated by the speed with which dissonance theory has evolved to accommodate empirical results" (p. 379). They suggested that the theory has continued to provide "nonobvious insights into human behavior" (p. 380) and that it "may have numerous practical applications" (p. 380).

Cooper and Croyle (1984) also explained that dissonance theory is flourishing, although the rate of research is not as high as it was in the 1960's. They reviewed literature focusing on modifications and revisions of the theory, practical implications and applications to other areas of concern, and selective exposure.

According to proponents of selective exposure, "people seek information that supports a decision between choice alternatives and avoid information inconsistent with the choice" (p. 411). Research has demonstrated that this does occur and the trend is moving toward identification of when and under what circumstances it is likely to occur.

There has been a movement, then, over the years toward alternative explanations for observed dissonance phenomena, reconceptualizations and elaborations of the theory, and increased emphasis on practical applications. In the words of Cooper and Croyle (1984): "Though dissonance research may no longer hold the forefront of attention in

social psychology, research has been active and debate has been lively" (p. 412). They emphasized that there is continued interest in dissonance theory, which is in opposition to Kiesler and Munson (1975) who reported research demonstrating that dissonance theory has been replaced by attribution theory as the most popular in social psychology. A particularly thorough review of dissonance theory and some of its attendant controversy is provided by Nuttin (1975).

Affective Component

The second aspect of attitudes is the affective component, described by Gagne (1985) as "the emotion or feeling that accompanies the idea" (p. 222). Attitudes can vary from positive to negative, proof of which has been demonstrated by introspective accounts as well as by physiological measures such as the galvanic skin response. Gagne provided brief explanations of research regarding the affective component, Staats (1968) explained the role of instrumental conditioning of stimuli, and Edwards and Ostrom (1971) studied the cognitive structure of neutral attitudes. However, the major emphasis of most of the literature appears to be on the cognitive and behavioral aspects of attitudes.

Behavioral Component

Gagne (1985) defined the behavioral aspect of attitudes as "pertaining to the predisposition or readiness for action (such as the action of purchasing an automobile having a high miles-per-gallon rating)" (p. 222). Gagne explained that there has been "an absence of any high degree of relationship between attitudes as reported by

responses to questions and actual behavior" (p. 223). As with the cognitive component, there have been vast numbers of writers seeking to explain this attitude-behavior inconsistency. Following is an explanation only of some more notable trends.

Eagly and Himmelfarb (1978) wrote that "an implicit assumption among those who study persuasion is that changed attitudes make it likely that related behaviors change also" (p. 527). They explained that while research in the late 1960's revealed poor predictability of behavior from attitudes, more current researchers, employing better methods, have demonstrated adequate predictability. According to Cialdini et al., researchers are no longer wondering "if" attitudes predict behaviors. Instead, the focus has changed to an investigation of "when" attitudes predict behaviors.

According to Cooper and Croyle (1984), there have been two categories of responses to the suggestion of a weak relationship between measured attitudes and subsequent behavior: one approach focuses on methodological problems and the other focuses on mediational variables and processes.

The major proponents of the view that methodological problems underlie this issue are Azjen and Fishbein (1977). In a particularly influential paper including an extensive literature review, they concluded that the methods used to assess attitudes are invalid. Following a review and theoretical analysis of 109 studies, they concluded that "low and inconsistent attitude-behavior relations are attributable to low or partial correspondence between at least attitudinal and behavioral entities" (p. 913). Attitudinal and behavioral entities refer to the target and action elements of the

assessment.

Azjen and Fishbein formulated a model of behavioral intentions, and according to their theory of reasoned action, attitudes toward objects or issues are less accurate predictors of intentions and actual behavior than are attitudes toward behavior. A critical premise of their model is that "attitudes influence behavior only through their impact on intentions" (Cooper and Croyle, 1984, p. 399). A detailed description of the model is provided by Shaw and Costanzo (1982) and support for the model is provided by Brinberg (1979) and Katz (1982).

According to Cooper and Croyle (1984), proponents of the view that methodological procedures are inadequate assume, "a priori, that people behave in accordance with their attitudes. If such relationships have not been demonstrated empirically, the methods of assessment are at fault (p. 397).

A second perspective explained by Cooper and Croyle (1984) and Gagne (1985) is that, by themselves, attitudes do not accurately predict behavior. Advocates of this position stress the importance of taking into account individual differences in experience, perception, cognition, context, and goals. Research conducted within this perspective tends to rely more on laboratory experiments than on field surveys, and suggests that mediating variables and processes affect the attitude-behavior relationship.

Research in this area has focused on identifying the mediating variables. Pryor, Gibbons, Wicklund, Fazio, and Hood (1977), for example, reported that "self-reports made under self-focused conditions are more likely to achieve a consistent relationship with actual behavior" (p. 526). Emphasized is the importance of self-awareness.

Zanna, Olson, and Fazio (1980) studied the role of self-perception of attitude and past behavioral experience with the attitude object. That repeated exposure to a stimulus might enhance attitudes was investigated by Zajonc (1968), Burgess and Sales (1971), Cacioppo and Petty (1979), and Fazio, Powell, and Herr (1983). Other mediating processes which have been studied include level of issue involvement (Petty & Cacioppo, 1979), and internal versus external locus of control (Zuckerman & Gerbasi, 1977).

Overall, then, the issue of attitude-behavior consistency has advanced from concern about whether it exists to concern about when it exists. It is here that divergence occurs in terms of whether the problems are methodological or mediational in nature. It is Cooper and Croyle's opinion that "one encouraging sign is the growing collaboration between those interested in attitude-behavior consistency issues and those interested in personality-consistency issues . . . a fruitful synthesis may be emerging" (1984, p. 404).

Summary of Components

To summarize, much research has been conducted and much controversy generated regarding the tri-component conceptualization of attitudes. Ostrom (1969) and Triandis (1967) provided assessments of the theoretical value of maintaining the tripartite classification scheme. Triandis presented evidence for the multidimensionality of attitudes. He reviewed studies which found distinctions among the affective, cognitive, and behavioral components, as well as multidimensionality within each one. Ostrom's data from three experiments led him to conclude that "variability exists between the mean evaluative responses

of the three components" (p. 29). Additionally, a more current writer (Gagne, 1985) endorsed this view that "attitudes are generally agreed to encompass three different aspects, which may be investigated separately or together" (p. 221).

The Scope of Attitudes

Attitudes can be directed toward persons, events, or objects. These can be large, inclusive classes or can include only one member (Gagne, 1985).

It is important that attitudes be differentiated from other similar constructs in social psychology. Shaw and Wright (1967) provided explanations of how the following terms can be differentiated: "belief," "concept," "motive," "value," "opinion," "set," "habit," and "trait." It is the intention of the present author to generate an awareness of the necessity for distinguishing among these similar concepts. It is beyond the scope of this review, however, to provide lengthy explanations of each term.

Attitude Learning and Change

Learning, wrote Gagne (1985), is the means by which attitudes are established and organized. Most attitudes are learned incidentally through the socialization process and some become remarkably resistant to change. However, the affective domain of the school curriculum is aimed at deliberately teaching or strengthening certain kinds of attitudes. While controversy runs rampant regarding the teaching of some attitudes, there seems to be community agreement about the value of attitudes such as respect for the individuality of others, a positive

attitude toward teachers, and cooperation in working with others.

Gagne (1985) provided a good overview of how attitudes are learned and changed. He claimed that whether attitudes are acquired slowly through socialization and experience, or more quickly as the result of a single experience, there seem to have been three major explanations of the process: classical conditioning, instrumental conditioning, and social learning theory. According to the present writer, while Gagne emphasizes these three behaviorist approaches (explained as follows), the importance of the cognitivist approaches already described should not be underestimated when it comes to explaining attitude learning and change.

Classical and Instrumental Conditioning

Staats (1967) criticized the separatist approach of studying either classical or instrumental conditioning in isolation. He suggested the following:

> An analysis of both aspects of attitudes [formation and function] is more comprehensive, the analysis may be used to indicate how classical and instrumental conditioning principles are closely intertwined in the study of human behavior, and this in turn enables the study of attitudes to be interrelated with the considerations of human motivation relevant to other social and behavioral sciences. (p. 373)

He examined the roles of both types of conditioning.

Classical conditioning is said to account for attitude formation in that emotional responses (attitudes) come to be elicited by many stimuli. Higher-order conditioning allows for transference of a response

to a new stimulus. In a laboratory study, Staats and Staats (1958) demonstrated that when familiar masculine names were presented together with either favorable words or unfavorable words, subsequent ratings of the names changed. An increased positive attitude was observed for the names paired with favorable words, and decreased ratings occurred for the names paired with unfavorable words.

Staats (1967) explained that the conditioned attitudinal stimulus would be capable of serving two functions. One function would be to elicit an emotional response in the individual as explained above. The other function would be to influence the individual's instrumental behaviors. Thus, the conditioned attitudinal stimulus will function as a reinforcer in the learning of instrumental behaviors. The results of one study showed that an instrumental response was strengthened following the presentation of positive attitudinal words in a response-contingent manner. The response was weakened by negative attitudinal words, and neutral words had an in-between effect.

Thus, according to Staats (1967), both classical and instrumental conditioning are involved in attitude formation and change. Further explanations and examples of research are provided by Gagne (1985) and Insko (1967).

Social Learning Theory

The role of social learning theory in the development and change of attitudes cannot be underestimated. In fact, "one of the most dependable sets of events that has been found to produce changes in attitudes is the phenomenon of human modeling" (Gagne, 1985, p. 232). Shaw and Costanzo (1982) wrote that experimental situations have

repeatedly demonstrated that people (especially children) "tend to use the behaviors of others as paradigms for their own behavior" (p. 42). Gagne (1985) explained that while parents and teachers serve as effective models for children, peers are the main medium through which adolescents are influenced.

Gagne (1985) explained that there are some prerequisite internal conditions necessary for human modeling to be effective in changing attitudes. First, the individual must understand the following three concepts: the relevant class of object, event, or person; the source of information (the credibility of the model has been shown to be more important for identification than the message content); and the personal actions required (for example, if the attitude object is cocaine, the person must understand how cocaine is ingested). In addition to a sufficient grasp of these concepts, it is necessary that the individual have information regarding the situations where the object, event, or person might be encountered.

Once these internal conditions have been met, there are some external conditions necessary for human modeling to be effective. The most important are observation of the model's choices and subsequent reinforcement, and reinforcement of similar behaviors on the part of the observer (Gagne, 1985).

Thus, it can be seen that there are internal and external prerequisites for human modeling to be effective in attitude formation and change. Shaw and Costanzo (1982) reiterate and elaborate upon the importance of the model, imitation, identification, and reinforcement. As well, they explain some different situations where social learning occurs, for example, through books, television, comic strips, and

real-life situations.

Summary of Attitude Learning and Change

Attitudes are learned and changed in different ways. Three effective approaches, according to Gagne (1985), are the behaviorist orientations of classical conditioning, instrumental conditioning, and social learning. While there has been much evidence to support the effectiveness of all three, the latter approach seems to be considered the most effective. Gagne, when discussing attitude learning and change, appears to place greater emphasis on the behaviorist orientations than the cognitivist, and the present writer emphasized the importance of including the cognitivist orientations as effective approaches also.

An enormous amount of information is available regarding more specific aspects of the attitude change process. Not discussed here, for example, is research on the following: the effects of group diffusion of cognitive effort (Petty, Harkins, and Williams, 1980), the effects of informational versus persuasive communication (Shaffer, Reardon, Clary, & Sadowski, 1982), the relationship between arousal and attitude change (Mintz & Mills, 1971), prior expectancy and behavioral extremity as determinants of attitude attribution (Jones, Worchel, Goethals, & Grumet, 1971), the effects of forewarning and distraction (Watts & Holt, 1979), and the relationship between communicator physical attractiveness and persuasiveness (Chaiken, 1979).

Conclusion

In conclusion, it can be seen that it was in the early 1930's that the study of attitudes gained tremendous momentum. However, it was not

until 1967 that the growing body of literature was professionally recognized as attitude theory (Ostrom, 1968). Although disillusionment with the lack of generality led to decreased emphasis in the latter part of the 1960's and early 1970's, the past decade has witnessed a revival of interest. A review of the emergence of the theory by Ostrom (1968) revealed the influence of several schools of thought including Gestalt, behaviorist, functionalist, social learning, and cognitivist.

That attitudes involve three components (cognitive, affective, and behavioral) appears to be the most accepted conceptualization today, although this view is not without controversy. Much research has investigated the value and nature of each component. Some of the more popular research has focused on cognitive dissonance and reported attitude-behavior inconsistency.

Definitions of attitude emphasize mental readiness and behavioral predispositions to respond. The general, learned, and enduring nature of attitudes allows for investigation of how they are formed and changed. Three major theoretical approaches which explain attitude learning and change include classical conditioning, instrumental conditioning, and social learning theory. Social learning is considered by Gagne (1985) as the most effective method.

While the present review focused on these three approaches, there are other conceptualizations of the process. Not discussed here, although described by Cooper and Croyle (1984) as gaining momentum in the research, are studies investigating the effects of attitudes on information processing (focusing on the relationship between prior attitude and the perception, encoding, and recall of subsequent information), and attempts to examine attitudes and attitude change with

psychophysiological instruments.

Thus, the study of attitude formation and change continues to be of central interest to social psychologists. The goal of this review was to elucidate some of the history and most notable current emphases. Excluded was a review of the attitude measurement literature. In the words of Eagly and Himmelfarb (1978), "Pronouncements about the death of the attitude concept and the impending death of attitude research were premature and grossly exaggerated" (p. 543). In fact, it appears that research and controversy is lively and stimulating!

C. Cognitive Development

Introduction

According to Ginsburg and Koslowski (1976), during the period of time from 1930 to 1960 developments in behavior theory overshadowed any contributions of the cognitive developmental theorists. A major paradigm shift within psychology occurred around 1960 when the popularity of behaviorism began to decline, "partly because of its internal contradictions and sterility and partly because it could not explain basic psychological phenomena, especially in the area of language" (p. 30). However, Ginsburg and Koslowski explained, even more important than the decline in popularity of behavior theory was the emergence of several lines of research which proved more interesting, vital, and productive.

One important development was an increase in interest in Piaget's work to the point where it accounted "for a significant proportion of all research in developmental psychology" (Ginsburg & Koslowki, 1976, p. 30). Baer and Wright (1974), Dacey (1986) and Masters (1981) agreed, and Thomas (1979) described him as "the single most important stimulator of research studies published in leading child development journals in the past decade or more" (p. 326). Whether or not one agrees with it, said Ginsburg and Koslowski, "Piaget's theory is still the most comprehensive and influential one in the field" (1976, p. 31).

A vast amount of literature has been published on the topic of Piagetian theory. Following is a brief summary of the main points of the theory and a more detailed analysis of the stage of "formal operations" and its measurement.

Piagetian Theory: An Overview

Piaget, as a genetic epistemologist, was concerned with investigating how knowledge develops in humans over time. In 1920 he concluded from his research at the Binet Laboratory in Paris that for full maturation of the intellect to occur, specific thinking abilities must previously have been acquired (Thomas, 1979).

Piaget conceived of intelligence as an evolving process and defined it "as a form of equilibration, or forms of equilibration, toward which all cognitive functions lead" (Piaget, 1976, p. 448). He described equilibration as compensation for an external disturbance and explained that this differed from the Gestalt theorists' interpretation as an automatic balance. According to Piaget's position the fundamental idea of reversibility is implied by this compensation and this reversibility characterizes the operations (internalized actions) of intelligence. Consequently he defined intelligence "in terms of operations, coordination of operations" (p. 448).

Elkind (1976) compared the similarities and differences between Piagetian and psychometric conceptions of intelligence and concluded that in both approaches "the essence of intelligence lies in the individual's reasoning capacities" (p. 531). Elkind explained that Piaget applied the term "intelligence" only to the rational processes. This functional and dynamic view conceives of intelligence (the rational processes) as the most advanced of human abilities. These abilities (rational processes) are characterized by the greatest independence from environmental and internal regulation (inherited accommodative and assimilative processes).

Piaget believed that all behavior or thought is purposeful and that the goal is adaptation to the environment in increasingly more satisfactory ways (Thomas, 1979). The tools of adaptation, or the mechanisms through which intelligence matures, consist of biological and/or mental schema. The terms "schema," "schemas," "scheme," and "schemata" have been used interchangeably in translations of Piaget's writings from the original French (Dacey, 1986; Thomas, 1979). According to Phillips, "a scheme is a kind of mini-system; it is that property of an action which can be generalized to other contents" (1975, p. 11).

Present at birth are innate tendencies toward organization (increasingly efficient combinations of schema), and adaptation to the environment through the complementary processes of assimilation and accommodation. Mental structures become increasingly more effective as they develop from the reflexes which characterize behavior at birth, to schema (elementary mental structures) soon after birth, to operations (higher-order psychological structures) at approximately 7 years of age (Dacey, 1986).

The central motivational factor in the Piagetian framework is the process of equilibration. According to Modgil and Modgil (1976), the notion of equilibration was introduced by Piaget "as being the overriding factor that determines the mode of interaction of maturation, physical experience and social experience" (p. 124). When new information is encountered by the individual, a state of disequilibrium occurs and the innate process of equilibration is used to restore cognitive harmony (and thus decrease the cognitive tension and conflict caused by the inconsistency). This cognitive growth is activated through the processes of assimilation and accommodation (Sarafino &

Armstrong, 1986).

Assimilation involves the application of existing mental structures (schemas) to deal with novel information and is defined by Sarafino and Armstrong as "a 'taking in' process through which new experiences and objects are incorporated into the child's schematic structure" (1986, p. 45). Accommodation, alternatively, is used to modify an existing schema or to acquire a new one "when an experience or object does not fit well within an existing schema" (p. 46).

Stages of the Theory: An Overview

Piaget distinguished four stages or as he referred to them, "four great stages, or four great periods" (1976, p. 448) in the development of intelligence. These stages are qualitatively different from one another and occur in an invariant sequence, although the exact ages of attainment vary among individuals and societies. Each stage differs qualitatively from the preceding stage along three dimensions: level of abstraction (characteristic operations), elements to which operations are applied, and structure of organization (structure or coordination among operations) (Neimark, 1975). Any age designations which are assigned to the periods should be recognized as only approximations or rough averages. As the individual progresses through the periods, the entirely self-centered infant grows into an adolescent who is capable of logic and abstract thinking (Thomas, 1979).

Cognitive development during the "sensorimotor" period (birth to age 2) is characterized by the way the child senses and subsequently acts upon the environment. Adaptation at the beginning of the period is reflexive and as the child grows older gradually becomes more

purposeful. Whereas previous attempts at problem-solving required direct sensory manipulation of the objects themselves, by approximately age 2 the child is mentally inventive and can mentally represent, combine, and manipulate objects to solve problems.

Within the sensorimotor period are the following six substages: reflex activity, primary circular reactions, secondary circular reactions, coordinating secondary circular reactions, tertiary circular reactions, and mental combinations and representations (Thomas, 1979; Sarafino & Armstrong, 1986). One of the more important acquisitions during this stage involves the development of knowledge regarding object permanence - that an object still exists even though it is out of sight. According to Sarafino and Armstrong, while Piaget's description of sensorimotor development is a clear and valid overview of the sequence of development, current researchers, "using ingenious designs and techniques, and tasks different from those Piaget used, are showing that infant cognitive abilities are more sophisticated than the substages indicate" (pp. 136-137).

Around the age of 2 years, the child enters the second period of cognitive development, the "preoperational" period. This period lasts from ages 2 to 7 and is described as preoperational as the child still lacks the ability to perform operations (mental actions) on information relevant to problem-solving. It is during this time that symbolic functioning abilities (demonstrated in language and drawings) advance dramatically. During this period the child's thinking is intuitive or semilogical due to the following limiting characteristics: an incomplete understanding of classes or categories, transductive thinking, centration, irreversibility, and egocentrism. Thus, while the child at

this age is forming many new concepts to represent experiences with objects and events, the thinking is immature and the concepts incomplete and imprecise (Sarafino & Armstrong, 1986).

During the years from approximately ages 7 to 11, the child is in the "concrete operational" period and becomes increasingly more capable of performing mental operations. Cognitive skills during this time become increasingly more logical and less restricted by the characteristics which limited thought during the preoperational stage. Thought, during this time, although it becomes more accurate, complex, and flexible, is still limited to problem-solving involving concrete objects (directly perceived or imagined identifiable objects). The child at this time is still unable to solve hypothetical, futuristic, and abstract problems. The egocentrism so characteristic of the preopoerational period decreases during the concrete operational period and the child becomes able to solve problems requiring the following types of understanding: reversibility, conservation, classification, and seriation (Sarafino & Armstrong, 1986; Thomas, 1979).

Between the ages of 11 and 15 years, during what Piaget called the "formal operations" period, the highest level of intellectual functioning emerges. This formal operational thought includes the ability to think logically about non-concrete ideas. According to Sarafino and Armstrong, this involves the following four abilities: the use of highly abstract concepts, the contemplation of hypothetical and future events, consideration of all possible combinations of concepts, and coordination of several related factors at one time.

Adolescent Cognitive Development

Neimark (1975), in a comprehensive review of the literature on adolescent cognitive development, explained that there are qualitative differences between the world of the child and that of the adolescent. These intellectual differences are "marked by the appearance of more abstract, powerful modes of thought and, in some individuals, of intense intellectual exploration and creativity made possible by these modes" (p. 541). In Piaget's words: "The essence of the logic of cultured adults and the basis for elementary scientific thought are thereby provided" (1972, p. 1).

In 1969, Flavell explained that while the study of adolescence had been popular since the turn of the century, the study of adolescent cognition had only recently become popular. The assumption that child and adolescent intellectual abilities differed only quantitatively accounted for the previous lack of interest. With Piaget's writings, beginning in 1923, and his explanations of the formal stage, came the understanding that the intellectual abilities of the adolescent differ qualitatively from those of the child.

In 1977, Martorano wrote that relatively few studies had been conducted regarding the stage of formal operations, in comparison to the large amount of research dealing with Piaget's earlier stages. Ross (1973) agreed that this stage had "received relatively little empirical attention" (p. 167), and Seggie (1978) noted that the following two aspects of the theory have received relatively scant attention: the details of the transition from concrete to formal operational thought, and the extent to which adolescents make this transition. In recent years, however, interest in the topic has increased and according to

Demetriou and Efklides (1985), "research on formal thought has flourished" (p. 1062). Neimark, in 1975, explained that Piaget's "elegant and comprehensive" theory of formal operational thought was the only "theoretical description of the nature and organization of adolescent thought" (p. 542).

As mentioned earlier, it is during the formal operational stage that the individual gains the ability to think logically about non-concrete ideas. Thus, abstract thought is possible and thinking becomes much more orderly and systematic. It is at this level of development that the adolescent becomes capable of operating on operations (or as Piaget referred to this, "second-order operations"). What this means is that the adolescent is "able to operate formally on concrete operations" (Phillips, 1975, pp. 128-129). According to Modgil and Modgil (1976), "the most distinctive property for formal thought is the reversal of the direction of thinking between 'reality' and 'possibility' in the subjects' method of approach" (p. 130). Thus, for the formal operational thinker, actuality becomes secondary to possibility.

According to Modgil and Modgil (1976), a prominent feature of formal operational thought is a shift in concern to verbal elements as opposed to objects. In elaboration: "Formal thinking is essentially hypothetico-deductive; deduction is no longer in reference to perceived reality but to hypothetical statements, to propositions (formulations of hypotheses or postulations of facts or events independently of whether or not they occur)" (p. 130). However, it is stressed, this does not mean that all verbal thought is formal in character.

The attainment of formal thought is characterized by propositional logic and by other structural changes in thought processes (Piaget, 1972; Seggie, 1978). As explained by Tomlinson-Keasey (1970), once the individual is able to consider all of the possibilities of a situation, as compared to the actualities considered by the concrete thinker, it is possible to speculate about potential empirical manipulations. Propositional logic becomes possible in that postulates can be substituted for objects.

Formal operational thought, in comparison to concrete operational thought, involves propositional logic which is superimposed on the logic of classes and relations. As in earlier stages, development of formal operations is affected by the maturation of the cerebral structures, physical experience, logico-mathematical experience, and social transmission of information. It is the important and necessary process of equilibration "which integrates the other four factors unto itself" (Phillips, 1975, p. 19).

The egocentrism displayed by children and adolescents is considered part of the process of development. The individual decenters, or becomes less egocentric with progression through the stages of cognitive development. According to Inhelder and Piaget (1958), associated with the adolescent phase of development is the attribution of unlimited power of thought. In their words:

> The indefinite extension of powers of thought made possible by the new instruments of propositional logic at first is conducive to a failure to distinguish between the ego's new and unprecedented capacities and the social or cosmic universe to which they are applied. (p. 345)

According to these authors, the focal point of the decentering process is entrance into the adult world. The adult world is described as "the occupational world or the beginning of serious professional training" (p. 346). Thus, the acquisition of a job transforms idealistic thinking and leads to more realistic thinking. This understanding, however, does not clarify the entire process of the passage from adolescent to adult cognitive functioning. Piaget (1972) admitted that there are still a "number of unresolved questions that need to be studied in greater detail" (p. 11).

Measurement of Formal Operations

Piagetian Methodology

Tests for measuring formal operational structures have been described by Inhelder and Piaget (1958). The procedure involves the administration by a tester of a single task or set of tasks. Piagetian investigations often begin with naturalistic observations and continue "as an interaction between the child and the 'experimenter' - an interaction in which each varies his own behavior in response to that of the other" (Phillips, 1975, p. 4). More specifically, observations of the testee's surroundings and behavior result in the formulation and subsequent testing of hypotheses concerning the underlying structures. The hypotheses are tested by "altering the surroundings slightly - by rearranging the materials, by posing the problem in a different way, or even by overtly suggesting to the subject a response different from the one predicted by the theory" (p. 3).

This procedure is aimed at understanding the structure of the mind (how it works) rather than the content. Understanding this is deemed

more important than measurement with the goal of predicting and controlling behavior. While this method of investigation provides information that traditional psychometric testing does not, there are also disadvantages. Following is an explanation of some of the difficulties.

It is evident from the previous discussion that the cognitive skills described as formal operational are very complex. The literature reveals "considerable disagreement concerning the age of onset and universality of attainment of Piaget's stage of formal operations" (Danner & Day, 1977, p. 1600). According to Piaget's theory, formal operational thought is supposed to emerge at approximately age 11 and will be ultimately achieved by all individuals. Many researchers, however, have been unable to replicate Piaget's findings.

According to Hobbs (1975), much of the variation which exists in the proportions of subjects classified as demonstrating formal operational thought is due to the wide variation in classification criteria. The researchers in Geneva consistently reported finding a "majority of subjects in Substage III-A by the age of 11 or 12, and in Substage III-B by the age of 14 or 15" (p. 11). Apparently, however, detailed descriptions of the samples are not provided and Piaget admitted that the approximate ages for the stages were based on a privileged population from the better schools of Geneva.

Higgins-Trenk and Gaite (1971), for example, tested 162 students in Wisconsin ranging in age from approximately 13 to 18 years and found that 43% reasoned formally on a volume conservation task and 32% responded at a formal operational level on open-ended situational dilemma tasks. They concluded that "the normal adolescent is unlikely to

reach the level of formal operational thought until his late teens or early twenties if he reaches it at all" and that "formal operational thought may be as elusive in adults" (p. 202).

Dulit (1972) administered two of the tasks described by Inhelder and Piaget (1958), the rings experiment and the liquids experiment, and concluded that only 20-35% of average ability adolescents between the ages of 16 and 17 functioned at a fully formal level. The same percentages applied for a small sample (N=12) of average adults. Approximately 60% of gifted 16- and 17-year-olds responded at a fully formal level and in this group males performed better than females. Dulit concluded that "fully developed formal-stage thinking seems to be far from commonplace or routine among normal adolescents and adults" (p. 296). In fact, like most other aspects of psychological maturity, formal operational thinking would be best conceptualized "as a potentiality only partially attained by most and fully attained only by some" (p. 281).

Martorano (1977) conducted a large scale comprehensive study in which 80 females between the ages of 11 and 18 each completed 10 Piagetian tasks. She found that with an increase in age came an increase in performance, and she suggested that while formal reasoning abilities begin to appear between the ages of 12 and 15, even the oldest subjects showed variability across tasks. Martorano concluded that formal operational thinking, "while emerging during adolescence, cannot be said to represent the characteristic mode of thought for that developmental period" (p. 671).

Studies consistently show that a majority of adolescents in other cultures do not function at the formal operational level. Neimark (1975)

and Sarafino and Armstrong (1986) described some of the more relevant research.

Several authors (Danner & Day, 1977; Hobbs, 1975; Neimark, 1975; Phillips, 1975; Sarafino & Armstrong, 1986) addressed the criticisms of Piaget's subjective clinical method. Neimark referred to "comments concerning inadequacy of data, methods, and formulation of research questions" (p. 576), and Danner and Day commented on the ambiguity of tasks designed to assess formal operational thinking. Phillips explained the difficulties inherent in trying to replicate such a non-standardized method of investigation and made reference to the susceptibility of such research results to the "experimenter effect" or "Rosenthal effect" (that the subject's behavior can be unknowingly and subtly influenced by the investigator).

Phillips (1975) agreed that there is much criticism of Piaget's method. However, he emphasized, before becoming too critical, one should realize the "deliberate effort that is made to give the child opportunities for responses that would not fit the theory" (p. 5). As well, Piaget's epistomelogical position that knowledge is action requires that in order to discern the underlying structure, an investigator would need to be flexible in terms of language and task approach. Thus, as Phillips wrote, "rigidly standardized procedures might defeat the very purpose for which they were designed, because their meanings vary from one subject to another. The important thing is to make contact with the child's thinking" (p. 5). In fact, the concern of a cognitive theory with central organizing processes (and their partial autonomy) recognizes the active rather than reactive nature of the individual.

Neimark (1975) responded to the so-called consistent lack of replications regarding the following:

1. Universality and stability within Western culture, across cultures, and across the lifespan,
2. Consistency across tasks, and
3. Other variables related to performance on tasks.

His opinion is that most of the conclusions that are based on consistent findings "are consistent relative to a narrow data base of heterogeneous studies" and the "the best one can obtain in many instances are conclusions about general trends or identification of relevant independent variables" (p. 577).

Neimark explained that Piaget (1972), when asked to reconsider in light of all of the evidence of inconsistency with regard to universality and stability within Western cultures, suggested that it is aptitudes and areas of professional specialization, not age, that determine when different individuals reach the level of formal thought. He still maintained that all individuals attain the level. He also agreed that the 15 tasks outlined by Inhelder and himself (1958) may not be appropriate for general use and that simpler, more general tasks should be developed.

In terms of cross-culture generality and stability across the lifespan, Neimark pointed out the remarkable lack of good research about which any conclusions can be drawn. He also stated that "available data are totally inadequate" (p. 579) to draw any conclusions about the consistency of performance across tasks. Other variables related to task performance are described as IQ, education, and specific training. Again, however, as many questions remain unanswered as have been

answered, and in Neimark's words "the most urgent need is for good longitudinal evidence about the development of formal operations from the ages of ten to twenty" (p. 581). He highlighted three general areas in which there is great potential for research:

1. Task considerations - there is a need for objective scores and standardization,
2. Lifespan development and stability, and the contributory roles of intelligence, individual differences, language, and specific training, and
3. The relation of formal thought development to the development of other behaviors.

Recent Developments

While Piaget's clinical method of investigation and the subsequent subjective nature of performance evaluation have been criticized, Neimark (1975) stressed that perhaps critics have been too hasty in their conclusions as there is a need for more research in the area, especially longitudinal studies. Several alternative methods of measuring cognition based on Piaget's framework have been developed and following are descriptions of three of these methods.

According to Phillips (1975) and Thomas (1979), a new scale of mental development is in the process of being standardized by two researchers, Laurendeau and Pinard, at the University of Montreal. The test is an attempt to combine the thoroughness and flexibility of Piaget's clinical method with the standardization of questioning of traditional psychometric methods. Personal communication with M. Laurendeau (December 8, 1986) revealed that the test is not published and because of its complexity and expense, is not available for public

use. Interested individuals, however, are invited to attend a training session at the University of Montreal.

For his doctoral dissertation, Hobbs (1975), in an attempt to provide classification guidelines which would require minimum subjective judgment by the experimenter, developed and administered four tasks which would objectively measure whether formal operational structures have been attained by secondary students. His results were positive but inherent in the procedure are some limitations. For example, the tasks require the manipulation of concrete equipment by the testees and thus require that the tester obtain the necessary equipment. In addition, direction from the tester is required throughout the testing session and this excludes large numbers of individuals from effectively participating at one time. Finally, the tasks are scientifically based and thus are not applicable to other subject areas without the type of generalization of cognitive ability which has been considered a weakness in Piaget's work.

Kirby and Biggs (1980) acknowledged Piaget's massive contributions but explained that neither his cognitive-developmental approach nor the traditional psychometric approach to measurement have been very useful in terms of educational instruction. They explained that neither one of these models has been successfully applied "to the understanding of individual differences in learning tasks" (p. 1). The traditional Piagetian approach is considered to be too theoretical and the psychometric approach too predictive (and lacking explanations of the predictions).

According to Biggs (1980), Piaget's "presumed relevance to education is today unquestioned. But when it comes down to precisely

what Piaget is meant to tell the classroom teacher, the situation becomes much less clear" (p. 91). Biggs and Collis (1982), following analyses of students' work in different subject areas, proposed a theory which "parallels the broad outline of classical Piagetian theory, but postulates rather different mechanisms within stages" (p. 212). Piaget, as a structuralist, conceived of stages as organized by general logical underlying structures. Biggs and Collis provided a new perspective, and emphasized the interaction of endogenous factors (for example, motivation, developmental stage, prior knowledge of the area) and particular, immediate task-related factors (for example, the quality of instruction).

Following an analysis of hundreds of responses from students (elementary, high school, and college), Biggs and Collis (1982) were unable to provide evidence to support the basic assumptions of stage theorists. They agreed that the sequence of stages progressed from simple to complex. However, students did not perform consistently across subject areas or across time. This led them to distinguish between the "hypothetical cognitive structure" (HCS), proposed by Piaget and the "structure of the observed learning outcome" (SOLO). The label "structure" is shifted from the individual to the individual's response on a particular task.

Biggs and Collis suggested that while a developmental stage might impose an upper limit on functioning, in most situations endogenous factors lead people to function at levels below their potential maximum. In their words:

> The distinction between HCS and SOLO is very important in understanding the relationship between developmental stage and

> quality of learning. Consequently we feel obliged to use different terminology to distinguish HCS stages from SOLO levels. This distinction is exactly analagous to that between ability and attainment . . .". (p. 22)

Thus, according to this model, students are not labelled as being at one stage or another. Rather, what is evaluated is the quality of performance on a particular task at a particular time.

The SOLO Taxomony provides a means of qualitatively evaluating learning according to test performance. The taxonomy is based on a modification (by Collis) of Piaget's stages. The sensorimotor stage and the intuitive period of preoperational thought are not included as relevant aspects and the early formal stage is placed at the upper end of the concrete operational stages. The following, then, are the relevant stages and approximate age ranges. Beside each stage is the SOLO term for the level of "response that is isomorphic to, but not identical with, its corresponding developmental stage" (Biggs & Collis, 1982, p. 26).

1. Pre-operational (4-6) . . . prestructural level,
2. Early concrete (7-9) . . . unistructural level,
3. Middle concrete (10-12) . . . multistructural level,
4. Concrete generalization (13-15) . . . relational level, and
5. Formal operational (16+) . . . extended abstract level.

This taxonomy was used to obtain an estimate of cognitive level of response in the present research.

Conclusion

In conclusion, Piaget's conception of cognitive development as progressing through an invariant series of four qualitatively different stages has been considered the most comprehensive and influential theory in the field. Although the theory originated in the 1920's, it was not until behavior theory declined in popularity around 1960 that research interest increased. Thomas (1985) attributed this high degree of research fertility to a variety of factors including the wide range of child life considered in the theory, the innovative tasks devised, the clinical method, and the limitations about the original sample from which inferences were drawn.

The stage of the theory which has been least investigated is the fourth and last one, formal operational thought. It is in this stage that the essence of adult thinking develops. During this time the structures for abstract thought develop and for the first time the individual becomes able to manipulate non-concrete ideas mentally . . . propositional logic becomes possible. With entrance into the adult world through the attainment of a job and/or professional training, comes adolescent decentration and adult realism. The acquisition of formal operational thought, and judgment as to whether the structural development is in its genesis or has become complete (attained equilibrium) have traditionally been assessed by the administration of tasks described by Inhelder and Piaget (1958). The procedure is aimed at understanding the mind (how it works) rather than the content. Understanding this is considered to be more important than measurement with the goal of predicting and controlling behavior.

Following a description of the theory, Thomas (1985) provided an assessment according to nine categories. On a scale of evaluation ranging from "very well" to "very poorly", the theory received top ratings for internal consistency, economy of explanation, and stimulation of new research. Ratings between moderately and very well were received for the remaining six standards: reflection of the real world of children (especially the average child), explanations of the past and predictions of the future (for the cognitive behaviors studied and for the average child), guidance in child rearing for educators (in cognitive areas), falsifiable aspects, and overall self-satisfaction. Weaknesses affecting the ratings of these last six areas of judgment are described as lack of explanations of individual differences, unsatisfactory circularity in some explanations, lack of child rearing guidance in areas other than cognitive areas (especially affective development), and finally, lack of testability of the stages and of core concepts (including schemes, assimilation, and accommodation).

In an attempt to compensate for some of the weaknesses of Piaget's method of measurement while still using his underlying framework of cognitive development, several new types of measurement have been proposed. Three approaches developed and tested in the last fifteen years include those by the following researchers: Laurendeau and Pinard (Phillips, 1975; Thomas, 1979), Hobbs (1975), and Biggs and Collis (1982).

Overall, then, it appears that Piaget's theory has withstood much of the testing of time and will continue to be a popular topic of future research, especially in terms of, for example, educational applications (in curriculum sequencing, grade placement of topics, assessment of

intellectual functioning, and teaching methodology, according to Thomas 1985), and cross-culture perspectives (Glick, 1975). Current researchers are developing new approaches to measurement based on the theory, thus increasing its validity for application to new areas.

D. Restatement of Rationale for Topics Reviewed

Reviews of the most pertinent aspects of the topics of adolescent pregnancy and parenthood, attitudes, and cognitive development (with a primary focus on adolescent thought processes) have been presented. The inclusion of these topics is based on the relevance of these issues to the study, as described in chapter I and reviewed as follows.

In chapter I, the significance of the problem of adolescent pregnancy and parenthood was addressed and it was proposed that an attitude change program could be developed as a preventive measure. This assertion was based on findings that attitudes can be altered, resulting in associated behavior changes. It was suggested that there are teens who, if they fully understood the process of conception and the possible consequences of pregnancy, would be more responsible in their sexual practices.

It was stressed that the following variables would be essential for inclusion in a study designed to assess attitudes toward pregnancy and parenting: cognition, age, sexual knowledge, sexual behavior, and experience with the issues of teen pregnancy and parenting. One reason cognition was included as a variable is because comprehension of the potential consequences of behavior involves abstract thinking capabilities. All of the variables outlined, according to Cooper and Croyle (1984) and Gagne (1985), are critical components in any study of

attitudes. The above is a summary of the rationale for the inclusion of these topics in the literature review for the dissertation.

III. METHODOLOGY

A. The Sample

The sample in the present study consisted of 330 female students from three schools in the Grande Prairie Public School District #2357 in Alberta. That maternal motivation was assessed necessitated the inclusion of only females as participants.

The sample was limited to students in Grades 9 to 11 for two reasons. First, formal operational thought was the cognitive functioning level of interest and students below the ninth grade would be unlikely to respond at a formal level. In addition, because the data were collected in the last month of the school year (June, 1987), students in Grade 12 were excluded as they might have different attitudes toward pregnancy and parenting than would students with at least 1 year of high school still to complete. Thus, at the time of participation in the study, 122 (37%) of the subjects were in Grade 9, 125 (38%) were in Grade 10, and 83 (25%) were in Grade 11. They ranged in age (rounded to the nearest year) from 14 to 19 years (mean=15.88, SD=0.92).

General information was collected from each student (see Appendix A for the specific questions). Only those responses considered relevant to the description of the sample have been included here and other components will be more meaningful when described with regard to specific questions in chapter IV.

Questions were answered regarding preferred spoken/written language, siblings, religion, education and career plans, babysitting experience, marriage and parenting plans, opinion regarding mothering in relation to age and marital status, and opinion regarding why teenage

girls become pregnant. Although the description of the sample is lengthy, the information included was considered meaningful and thus is elaborated upon as follows.

Given that the questionnaires required written responses, it was considered important to determine the language(s) preferred by each subject. Each was asked to indicate a preference for speaking/writing according to the following categories: "English," "French," and "Other (explain)." The responses revealed that 319 (97%) usually speak/write English, 1 (<1%) French, 1 (<1%) Other (Arabic was specified), and 9 (3%) indicated two languages. In each of the nine instances where two languages were specified, one of the languages was English and the second choices were as follows: French (n=3), Arabic, Chinese, Hindi, Italian, Laotian, and Spanish. According to these numbers, then, language should not be considered a barrier in terms of performance on the questionnaires for the vast majority of respondents.

Each subject was asked to indicate her total number of siblings as well as their ages. This information enabled an estimate of birth order to be calculated. The data revealed that, for the sample, the total number of siblings ranged from 0 to 8 (mean=2, SD=1.27). The number of younger siblings ranged from 0 to 5 (mean=1.07, SD=1.03, 9 missing cases), and the number of older siblings ranged from 0 to 8 (mean=0.93, SD=1.22, 8 missing cases). Overall, 74.2% of the respondents had 2 or less, and 95.5% had 4 or less siblings at the time of response.

In terms of birth order, 10 subjects (3%) had no siblings and thus were "only" children, 93 (28.2%) were the youngest of the children in their families, 147 (44.5%) were the oldest children, and 70 (21.2%) were somewhere in the middle. The number of missing cases for these

frequencies was 10 (3%). Overall, then, the majority of respondents had siblings and the majority were the oldest children in their families.

In error, a question regarding religious affiliation was omitted from the questionnaire. However, this was noted and at the time of questionnaire administration the respondents were asked verbally to write their religion at the top of the first page. The religions indicated by the responses were as follows: Protestant (n=79, 23.9%), Roman Catholic (n=23, 7%), Christian (n=24, 7.3%), Mormon (n=4, 1.2%), Jehovah's Witness (n=3, 0.9%), Hinduism (n=1, 0.3%), and Muslem (n=1, 0.3%). "No religion" was written by 126 (38.2%) students, and no responses (missing data) were provided on 69 (20.9%) of the questionnaires. Had response categories been provided by the researcher, fewer categories perhaps would have resulted. However, responses such as "Christian" do not lend themselves to inclusion in one of the other categories. Additionally, provision for responses on the questionnaires may have resulted in less missing data.

With regard to education and career plans, the participants provided information with respect to their intention to complete high school, to continue their education following high school, and the type of work they would most like to do. The responses indicated that 327 (99.1%) intended to complete high school and 3 (0.9%) did not. Most of the girls (n=245, 74.2%) planned to continue their education, 15 (4.5%) did not, and 70 (21.2%) were not sure about their plans in this area.

The question asking about the type of work desired after high school was of an open-ended format and thus the answers needed to be categorized by the researcher. The responses were grouped according to the method currently used for statistical surveys by Statistics Canada

(1981). This structure classifies occupations by major groups and then minor and unit groups embedded within the major ones. The major groupings were used for the purpose of the present classification and the frequency distribution is presented in Appendix E. As revealed by the frequencies, the vast majority of students had an idea of what type of career they would like and the expressed preferences encompassed a wide spectrum of possibilities.

With respect to babysitting experience, only a brief explanation will be provided here. Only 16 (4.8%) respondents indicated they did not ever babysit. Of the 314 (95.2%) who reported that they did, 43 (13%) babysat "hardly ever," 132 (40%) "sometimes," and 139 (42.1%) "often." In addition, 287 (87%) indicated they liked babysitting and 27 (8.2%) did not like it. The majority of the 330 girls in the sample (n=239, 72.4%) had taken a babysitting course, and 91 (27.6%) had not.

The students were asked whether they would like to get married some day, whether they would like to be a mother some day, and if the answers were "yes," what ages they would like to be at each of the times. In instances where more than one age was provided in response to either of these questions, the youngest one given was coded for data analysis. Most indicated they would like to get married (n=265, 80.3%), but 13 (3.9%) would not, and 52 (15.8%) were not sure. The preferred ages for marriage ranged from 18 to 50 years (mean=23.66, SD=3.24, 19 missing responses). The majority of the girls expressed that they would like to be mothers some day (n=257, 77.9%). A small number, however, (n=28, 8.5%) said they would not, and 45 (13.6%) were not sure. The preferred ages for having a first child ranged from 19 to 38 years (mean=25.39, SD=2.96, 58 missing cases).

A question was included to gather information about the respondents' opinions regarding mothering in relation to age and marital status. The responses revealed that while 20 (6.1%) of the girls thought it would be the same to be a mother while under the age of 18 years and unmarried, 308 (93.3%) thought it would not (2 missing cases). The explanations given for the responses varied but references to the effect upon the following were often included: education and career goals, social life, and financial and/or emotional support from the child's father.

An open-ended question was designed to provide participants with the opportunity to express their opinions regarding why adolescent girls become pregnant. The responses were varied and most interesting. Because of the extensive amount of information, the categorized responses are contained in Appendix F (an explanation of the categorization process is included following Table F-1).

B. The Instruments

Each student completed three paper-and pencil group-administered tests: a measure of maternal motivation, a measure of cognitive level of response, and a measure of sexual knowledge and sexual behavior. That the tests were group-administered was considered an advantage as they could be answered anonymously and it is suggested that anonymity should result in more honest responses. Following is a description of each of the instruments and their reliability and validity.

Modified Maternal Attitude Questionnaire

This measure of maternal motivation for pregnancy and parenthood is a modification of the Maternal Attitude Questionnaire (MAQ) designed and tested by Miller (1981). The original MAQ consists of two parts. Part I contains 32 statements which describe positive aspects of pregnancy and having children and participants rate the desirability of each item on a 4-option scale: "very," "moderately," "slightly," or "not" desirable. Part II consists of 26 items which describe undesirable things associated with pregnancy and having children and respondents are asked to rate the undesirability of each on a 4-option scale: "very," "moderately," "slightly," or "not" undesirable. The original questions were administered with the exception of modifications in the wording of some items, with W. Miller's consent (personal communication, December 17, 1986), to make them more appropriate for teenage girls. In addition, to minimize confusion for younger girls the format was modified so that the items form one scale with response options ranging from 1 to 7: "highly undesirable" (1) to "highly desirable" (7), rather than the two parts prepared by Miller. Appendix C contains the modified version used in the present research.

Reliability

There is good evidence for reliability of Miller's scale. A Cronbach's Alpha of .94 was reported for the overall maternal motivation score, and a correlation of .86 was reported for test-retest (4-week interval) reliability. Additionally, poor items were discarded after item analysis and this increases the reliability of the instrument.

The modified version used in the present research was administered to 135 first-year students from the Faculty of Education and School of Nursing at the University of Alberta. An item analysis was conducted, poor items were discarded, and the revised questions were administered to 56 first-year Education students. Of the 59 original items, 54 revealed good item-total correlations and good variance of response choices (dispersion of responses across the 1-7 option scale). For the total N of 191, the item analysis revealed a Hoyt's ANOVA of .95 which, like the Cronbach's Alpha, is an estimate of internal consistency (the degree to which the items measure the same variables).

Validity

There is good evidence for validity of Miller's questionnaire. Construct validity (the degree to which it measures the hypothetical trait it is supposed to measure) was provided in two ways. First, in developing the questions, Miller conducted extensive interviews and item analyses. He presented evidence that two of his primary criterion scales (Large Desired Family and Pregnancy Now) correlated very highly with results from interviews of women either trying to conceive or seeking abortion. An additional type of construct validity, factorial validity, was reported by Miller, and this means that items purported to measure the same underlying construct share common variance.

A second type of validity, face validity, is evident in the original questionnaire in that the questions appear on the surface to be measuring maternal motivation. With respect to the modification of the questionnaire to be used in the present research, factorial validity was provided through the procedure of factor analysis. The pilot data

revealed the following four meaningful underlying factors: Maternal Instinct (the affective aspects of childbearing), Readiness, Personal Benefits, and Convenience. The data collected in Grande Prairie revealed the following four factors: Personal Benefits, Readiness, Physical Aspects, and Convenience. A detailed discussion of these factors is provided in chapter IV of the thesis. Additionally, that the questions appear on the surface to measure maternal motivation is evidence for face validity.

Measure of Cognitive Level of Response

In order to receive information regarding the quality of thought (as given by a written response) regarding the consequences of teenage pregnancy and parenthood, the students provided written responses to five open-ended questions (see Appendix B). One general question was asked, as well as four more specific questions designed to gain information about each of the four factors underlying the Modified Maternal Attitude Questionnaire. Thus, at the time that attitudes were measured, information was collected regarding the students' quality of thought on the topic.

The responses were analyzed according to the SOLO Taxonomy described by Biggs and Collis (1982). Within this framework, responses are categorized on a scale from 1 to 5 (ranging from "prestructural" to "extended abstract" in quality) according to the following four dimensions: working memory capacity, cue and response interrelationship, consistency and closure within a response, and general overall structure. The particular scoring techniques for each of these is described by the authors and was used for the current data analysis.

Reliability

Biggs and Collis (1982) addressed three types of reliability: consistency across items, test-retest reliability, and interjudge agreement. To elaborate, with regard to consistency across items, the authors wrote that "SOLO level is not meant to reflect a stable trait of the individual. . .but the quality of a specific response at a given stage in his learning" (p. 186). In addition, because "SOLO is a response measure" (p. 186) and is "intended to be sensitive to instruction" (p. 186), test-retest reliability should not be expected.

The third type of reliability, interjudge agreement, is described as the most crucial aspect. Research results regarding interjudge agreement across several course content areas have been promising. Correlations ranging from .71 to .95 have been cited, providing evidence that judges tend to agree on response evaluation. The authors reported that while further studies are underway, the results to date are quite acceptable.

Validity

Biggs and Collis (1982) examined the relationship between SOLO levels and other measures of achievement and found that quality as defined by SOLO and quality as defined by teachers were reasonably in agreement. In one evaluation, correlations between SOLO and teacher ratings ranged from .35 to .75. In addition, "the intercorrelations between SOLO ratings are higher than those between teacher ratings, suggesting a more stable and generalized structure in SOLO" (p. 190).

In order to provide a second measure of validity, SOLO test results were combined with results from other tests with more

identifiable natures and an estimate of its factorial validity was obtained using the procedure of factor analysis. In one study, the researchers administered a battery of 19 tests measuring various cognitive abilities, school achievement, motives for learning, and learning strategies. The results indicated that both of Factors 1 and 2 were "defined by differing proportions of variance from school achievement" (p. 192). However, the difference between the two factors is related to process. Perhaps best explained by the authors, "this factor analysis has shown two aspects of achievement, one that relies on a pinpointing ability to identify the correct answer; the other that relies on a relating ability to take aspects of a situation and integrate them" (p. 192). A potential parallel is suggested between these aspects and quantitative versus qualitative aspects of achievement. Overall, there is evidence to suggest that SOLO levels do relate to school achievement as reflected by teachers' assessments of student performance.

Measure of Sexual Knowledge and Sexual Behavior

The instrument used to measure each subject's sexual knowledge and sexual behavior consisted of a selection of items from the Sexual Knowledge Questionnaire (SKQ) devised by Meikle, Peitchinis, and Pearce (1985) and used in a study of adolescent sexual activity in Calgary, Alberta.

Their Sexual Knowledge Questionnaire includes two subtests, the Reproductive Physiology Test (RPT) and the Contraceptive Knowledge Test (CKQ), as well as other questions related to sexuality. In total there are 45 questions. Because of the length and specificity of the other

questionnaires used in the present study, a 45-item questionnaire was considered too lengthy and time-consuming. In addition, some items were not directly relevant to the questions of interest. Thus, 17 items were selected for administration. Eleven of the 12 items from the Reproductive Physiology Test were chosen (primarily due to questionable relevance to the current study, the question, "What is the correct name for the external male sex organ?" was excluded), as well as questions related to dating, intercourse, birth control, and pregnancy (some format changes were made to shorten some questions). While the 11 questions from the RPT provided information about sexual knowledge, the others yielded information regarding sexual behavior. The questionnaire used in the present study is contained in Appendix D.

Following is a description of the Sexual Knowledge Questionnaire, including reliability and validity considerations. According to Meikle et al. (1985), the SKQ was subjected to considerable pretesting with junior- and senior-high-school students for appropriateness with regard to both the coverage and wording of the questions. Additionally, the accuracy of all items and their answers was screened by a senior member of the Department of Obstetrics and Gynecology at a local medical school.

Questions 3 through 14 of the Sexual Knowledge Questionnaire form the Reproductive Physiology Test (in the version used in this study, the questions are numbered 2 through 13). The 12 items (11 are included in this research) evaluate knowledge about sex and reproduction and each is worth 1 point toward the total score.

Reliability

Test-retest reliability was estimated by the administration of the RPT to two independent groups of subjects with a 17-day interval between testings for one group (N=46) and a 14-day interval for the second group (N=69). The correlations, respectively, were .63 and .59. The authors indicate that an examination of the standard deviations revealed a possible reason for what may appear as rather low correlations. For both groups, the retest standard deviations were smaller than the original ones, and it is suggested that this may have resulted from the use of the interval between testings for improvement of knowledge by some students (especially those who scored poorly on the first test). This would reduce the test-retest correlations and thus lower the stability of scores over time.

Validity

The individual items in the RPT were tested in a pilot study for appropriateness with regard to use with teenagers. Format changes were made to ensure that students from 13 to 18 years of age could understand the questions.

The authors claim that most questions have "obvious face validity" (p. 41), especially regarding unwanted pregnancy. According to them: "If an individual wrongly answers the question, 'A girl is most likely to get pregnant the day after her menstrual period,' and then acts accordingly, the chances of a pregnancy occurring increase significantly" (pp. 41-42).

Evidence of construct validity emerged during the course of the research, according to Meikle et al.. Expectations concerning how a

valid test should perform were consistent with the following two findings: Test scores steadily improved with increasing age, and students from better educational backgrounds performed better than those from lower backgrounds.

Finally, in an attempt to estimate the extent of bias and faking, Meikle et al. included a question asking the students "to estimate how honestly they felt their peers would answer the various tests" (p. 42). The responses revealed that over 80% of the respondents thought their peers would respond honestly 75% of the time. This was interpreted as suggestive that the results would not be seriously jeopardized by systematic bias.

C. Data Collection

In April, 1987, the research proposal and quesionnaires were submitted to the Department of Educational Psychology ethics committee and following the receipt of approval, were submitted to Mr. Gerry Mazer, Assistant Superintendent of Schools for the Grande Prairie Public School District #2357 (April, 18, 1987). Following his acceptance of the proposed research, the investigator travelled to Grande Prairie for further discussion and planning regarding the data collection.

At that time, Mr. Mazer arranged a meeting with several school counsellors, the coordinator of the Pregnant Teens' Program, and the manager of the Sexuality Education and Family Planning Division of the South Peace Health Unit, to enable the researcher to explain the details of the proposed research. Valuable feedback was received at the meeting, particularly regarding the types of questions that would be appropriate for the gathering of information about sexual knowledge and sexual

behavior. During the visit, meetings were also scheduled with each of the principals/vice-principals of the three schools to be involved in the study and the project was explained to each of them.

All parents/guardians were informed of the nature of the study via a newsletter constructed and sent directly to the homes by the school personnel and any parents/guardians who were concerned about their daughters' participation were encouraged to contact the appropriate school principals. Interestingly, no complaints were received and thus the sample included all of the girls in Grades 9 to 11 who were in attendance on the days the questionnaires were administered.

The respective principals/vice-principals, counsellors, and teachers were very accommodating and arranged for the students to be available during school hours for the group-administration of the questionnaires by the researcher. The data were collected June 8th, 10th, and 11th, 1987. At the time of administration, the students were informed that the study was designed to find out what teenage girls think about teenage pregnancy and parenthood. The average time used for completion of all of the questions was approximately 40 minutes per student.

It was intended that the anonymous group-administration of the questionnaires would reduce student anxiety and increase response honesty. Although some talking and giggling occurred, this was attributed to nervousness elicited by the nature of the questions and was not considered a threat to the responses. The subsequent scoring and coding of responses revealed that all of the 330 questionnaires administered were usable and it appeared that the participants had taken the research seriously and provided relevant responses.

In some instances, questions were left blank or two or more answers were provided, leaving the responses unscorable. During the coding of the data these were left blank and during the analysis were treated as missing data.

D. Data Analysis

Statistical programs available through both the Division of Educational Research Services (DERS) at the University of Alberta and the Statistical Program for the Social Sciences (SPSS^{X}) were used to analyze the data. While both DERS and SPSS^{X} programs were used for the analysis of the attitude data (research question 1), SPSS^{X} was used for all subsequent analysis. The specific procedures used for each research question are as follows.

For research question 1, the analysis of the Modified Maternal Attitude Questionnaire, a series of steps was involved. First, for each item the response circled by the participant was given the corresponding value of that reponse category. The response categories range from 1 to 7 ("highly undesirable" to "highly desirable").

A factor analysis was then conducted using the FACT20 package available through DERS. The questions loading on the resultant factors were entered into the item analysis package, TEST23 (DERS), and information was obtained regarding the quality of each test item (variance of responses, and item-subtest and item-total test correlations), as well as estimates of reliability (internal consistency).

Using SPSS^{X}, the mean scores for each factor and the total test were calculated for each individual and were interpreted as follows:

scores ranging from 1 to 3 were considered indicative of an undesirable attitude toward pregnancy and parenting, scores of 4 were considered indicative of a neutral attitude, and scores between 5 and 7 were considered indicative of a desirable attitude. These mean scores were used for the analysis of the relationship between attitudes and the other variables assessed in the thesis.

Factor scores were not computed and used in the analysis because the calculation procedure weights the individual test items differentially before it sums them. According to Kerlinger (1967), one of the characteristics of a summated (Likert-type) rating scale is that "U, the universe of items, is conceived to be a set of items of equal 'attitude value' . . . and thus there is no scale of items, as such" (p. 484). He explained that it is the sums or averages of the individuals' responses to the items, not the items themselves, that are scaled. Thus, the use of factor scores would have been inappropriate in this study as their method of computation results in scores that are inconsistent with the assumptions of a Likert-type scale such as the Modified MAQ. It is important to stress here that because mean scores rather than factor scores were utilized in the analysis, unless the factor analysis procedure itself is being referred to, the factors underlying the Modified MAQ will be more appropriately referred to as "subtests" for the remainder of this thesis.

With regard to research question 2, the open-ended questions designed to measure level of cognitive response as per the SOLO Taxonomy were scored according to the guidelines provided by Biggs and Collis (1982). First, for each question, the number and interrelatedness (if any) of the relevant points made by the students was noted. Next, this

information was used to assign each question a level from 1 to 5 according to the following general frame of reference:

1. Prestructural: denial (avoidance of the question), tautology (repetition of the question), or firm closure based on transduction.
2. Unistructural: one relevant point is presented. Limited and likely dogmatic conclusion.
3. Multistructural: two or more relevant points are presented but are not related to each other. ". . . any inconsistencies or conflicts are ignored or discounted so that a firm conclusion is reached" (p. 36).
4. Relational: two or more relevant points are presented and reconciliation is attempted. "Conflicting data are placed into a system that accounts for the given context" (p. 36).
5. Extended abstract: two or more relevant points are presented and a relating principle is provided. There is ". . . recognition that the given example is an instance of a more general case" (p. 36). Hypotheses about not experienced "examples are entertained, and the conclusions are held open" (p. 36).

For each question, the level and number of relevant points were coded for subsequent data analysis (Appendix H includes sample responses and scores for each level of SOLO question 3). Additionally, in order to obtain estimates of inter-rater reliability for the scores on the levels and number of relevant points, 50 questions representing the range of responses across the questions, the levels, and the number of relevant points were selected and submitted to two trained raters for scoring.

With regard to the levels, the inter-rater agreement was 80% for the first rater and 60% for the second. The Pearson product-moment correlations were .91 and .85 ($p \leq .01$). Biggs and Collis (1982) cited correlations ranging from .71 to .95 as evidence that raters agreed on the evaluation of responses. The coefficients obtained in the current study, then, are high within this range. In fact, Biggs (personal communication, November 19, 1987) explained that these ratings were among the highest he had seen reported and thus should be considered excellent. He suggested that engaging a third rater would be superfluous.

Pearson correlations were also calculated for the number of relevant points scored by the raters for the questions. The resultant coefficients were .93 and .88 ($p \leq .01$), which can be considered excellent evidence that directional correspondence occurred between the researcher's scores and those of both raters.

Because the number of relevant points is quantitative and continuous in nature and no comparisons are made among specific numbers of relevant points, correlations provide more meaningful information than percent agreement on responses. The levels, however, are more qualitative and discrete in nature, and because they are subjected to comparison with one another, percent agreement was reported in addition to correlations.

Thus, the percent agreement and correlation coefficients calculated for the inter-rater reliability provide evidence that scorers generally agreed on response evaluation. This is an important finding because, according to Biggs and Collis, interjudge agreement is the most crucial type of reliability with regard to questions scored according to

the SOLO Taxonomy.

A number of statistical analyses were performed on the data obtained from the SOLO questions. Scatterplots were produced in order to examine the relationships between age and and the SOLO question responses. The relationships between attitudes and the SOLO question responses were investigated using the following procedures: scatterplots (to assess the relationship between the number of relevant points attained for each SOLO question and the attitude tests), univariate one-way analyses of variance (attitude tests by SOLO questions), multivariate one-way analyses of variance (attitude subtests by SOLO questions), and chi-square tests of independence (attitude tests by SOLO questions).

Question 3, the relationship between age and attitudes was investigated using the following procedures. First, scatterplots were produced and Pearson correlations obtained for each set of variables. Next, the ages calculated to two decimal points were examined for breaks where they could be appropriately combined when rounded to the nearest year in order to create more equal numbers within groups for the purpose of further analysis. Chi-square tests of independence were performed, and finally, means were compared using a univariate one-way analysis of variance (Total Test by age), and a multivariate one-way analysis of variance (subtests by age).

For question 4, the relationship between sexual knowledge and attitudes, a scatterplot and correlation were computed.

The analysis of the relationship between sexual behavior and attitudes, research question 5, involved the calculations of four univariate and four multivariate one-way analyses of variance. The

ANOVAs were used to compare sexual behavior mean scores (Sexual Knowledge Questionnaire items 14, 15, 16, and 17) for the Total Test attitude score, and the MANOVAs were calculated in order to compare mean scores (the same SKQ items) on the attitude subtests.

Finally, question 6, looking at experience with pregnancy and parenthood, was examined using ANOVAs and MANOVAs as in the analysis of question 5. The comparison of means, however, included items numbered 13, 13c, 14, and 14c from the questionnaire gathering general information about the participants.

Additional questions arose during the course of the data analysis and interpretation. The following analyses are interpreted in chapter IV: the relationships between attitudes and birth order, attitudes and religious affiliation, and sexual knowledge (SKQ total score) and sexual behavior (SKQ items 14, 15, 16, and 17). The former two were assessed using ANOVAs (Total Test by birth order; Total Test by religious affiliation), and MANOVAs (subtests by birth order; subtests by religious affiliation), and the latter was determined using two-tailed t tests. The minimum criterion for significance of the t values was set at the .05 level.

For each of the chi-square tests of independence computed in the analysis of the research questions, the mean criterion for significance was set at the .05 level. For each of the ANOVAs, mean scores were compared at the .01, .05, and .10 levels of significance using the Scheffe procedure. Comparisons at the .10 level were included because the Scheffe test, according to Ferguson (1981) and Norusis (1983), is conservative and leads to fewer significant results (Type I error) than some other tests. For each of the MANOVAs calculated, the

Pillais-Bartlett Trace statistical test was used to determine the significance of the multivariate F value and means were compared using Scheffe tests. The minimum criterion for significance for the multivariate F was set at the .05 level. The univariate and multivariate analysis of variance tables are included, respectively, in Appendices I and J.

Finally, the description of the sample (in chapter III) and the data analysis for the research questions (chapter IV) involved the calculation and interpretation of frequency distributions and crosstabulations of variables.

E. Delimitations and Limitations of the Study

As with any research, there are delimitations as well as limitations which affect the study and it is important that the reader be informed of these and that the results be read with these in mind. With regard to the present study, the reader is reminded of the exploratory nature of the research in order that the results and interpretation can be read more meaningfully.

Delimitations

This study involved the assessment of relationships among variables described by Cooper and Croyle (1984) and Gagne (1985) as vital to research regarding attitudes. Although there was an endeavor to be somewhat comprehensive in the survey, the examination of all variables relevant to adolescent pregnancy and parenthood was impossible and thus important aspects have either been excluded or accorded only superficial attention, but are recommended as issues for study in

further research (see chapter V). To enable a detailed investigation of the research questions outlined in chapter I, the following restrictions were imposed on the study by the researcher.

1. The sample was limited to females only as the inclusion of males would have necessitated the development of a questionnaire designed to measure paternal motivation.

2. The participants were from three grades (9, 10, and 11). The rationale was that the inclusion of younger students would have lessened the likelihood of receiving responses at the higher cognitive levels on the open-ended questions scored according to the SOLO procedure, and students in Grade 12 were excluded because the data were collected at the end of the school year and the consequences of pregnancy might differ for them compared to girls with at least a year of high school yet to complete.

3. The 330 students in the sample attended urban public schools. Because the study is exploratory in nature, it is not recommended that the results be generalized to other populations.

4. Many variables were assessed in the current study and their relationships with attitudes investigated. Due to their interrelatedness and the test format, however, some types of statistical analysis which would have provided useful information were inappropriate. For example, multiple regression analysis was not possible because most of the variables were classes and some variables, for example, the attitude test and SOLO question responses, were not independent of one another.

5. It was beyond the scope of the study to assess the relationships among all variables measured. The resultant interpretation and discussion would have increased beyond meaningfulness and

readability. Therefore, due to the amount and nature of the data collected, some unanswered questions might present themselves to the reader during the perusal of the dissertation.

6. The topic of adolescent sexuality is controversial in nature. The thesis builds an argument for preventive programming regarding pregnancy and although opposition to such programming exists, it is not directly addressed other than as follows. In 1986, the writer approached three Alberta school divisions with requests for access to students for the purpose of questionnaire pretesting. While one district was very accommodating and pilot data was obtained, the remaining two refused the research. In one instance the superintendent expressed personal support for the proposed research but was concerned that the community would react negatively to a study regarding sexuality. The other superintendent felt that adolescents were not sexually active in the community and thus considered the research unnecessary.

Limitations

Limitations inherent in the research as well as some which were unforeseen but arose during the course of the study are described as follows.

1. One result of the selection of a narrow range of grades for participation (delimitation #2) was that too few responses were received at some of the SOLO levels, especially Level 5, the extended abstract response level, for inclusion in some statistical procedures (for example, chi-square tests of independence and analysis of variance). Although research has shown that abstract thinking skills are attained by far fewer adolescents than Piaget suggested (Dulit, 1972; Martorano,

1977), it was anticipated that the inclusion of students in Grades 10 and 11 would provide for sufficient responses at this level. This, however, was not the case.

2. Because all of the participants were in attendance at urban public schools, it is not recommended that the results be generalized to other groups of students; for example, those attending rural schools, religious-based schools, or to those who have dropped out of school.

3. Although responses to the questions on the Modified Maternal Attitude Questionnaire were observed across the 1-7 response continuum for individuals, the mean scores clustered toward the negative end of the scale. There was a particularly large number of responses at the extreme negative end and whether this was an artifact of the scale or the result of some factor which was not assessed is unknown. This clumping, however, may have resulted in no statistical significance for some comparisons when a greater dispersion of scores would have resulted in the opposite.

As mentioned, it is possible that the clumping was an artifact of the scale in that it resulted from a compression of items which may have been responded to with even a greater degree of negativity had there been more response options available on the scale. To elaborate, perhaps a floor effect occurred and if the responses had been allowed to become more negative there would have been a more even response distribution. One way to avoid this in the future might be to include more items in the questionnaire which would be likely to receive neutral or positive responses from the target population.

Alternatively, the cluster may have been due to some factor not accounted for such as religious affiliation, amount and type of sex

education, tendency toward the adoption of extreme viewpoints (a test of ambiguity might provide useful information with regard to this), amount of movement away from the immediate family and toward peers and adolescent culture, and locus of control (internal versus external).

4. The questions scored according to the SOLO procedure were based on factors revealed by the pilot data (received from adolescents and first-year university students). Because only three of the four factors revealed by the factor analysis of the research data were the same as those revealed in the pilot data, only four of the five intended comparisons between attitudes and the SOLO responses were possible.

IV. RESULTS AND DISCUSSION

The results of the study are presented in six main sections corresponding to the research questions. To summarize, the intent of the questions was to examine, respectively, the nature of adolescent females' attitudes toward adolescent pregnancy and parenthood and the relationship between these attitudes and the following variables: cognition, age, sexual knowledge, sexual behavior, and experience with teenage pregnancy and parenthood. Because of the number and interrelatedness of the questions addressed, the results and discussion for each are presented consecutively in chapter IV rather than in separate chapters. It is suggested that this format will increase readability and thus increase meaningfulness for the reader.

A. Question 1

What are adolescent females' attitudes toward pregnancy and parenthood?

Results

The interpretation of attitudes from the Modified Maternal Attitude Questionnaire included factor and item analyses as well as the computation of mean scores. The results of these are elaborated upon as follows.

The attitude questionnaire was factored using the principal axis method and the factors were rotated according to the oblique promax procedure. Three- four- and five-factor solutions were requested and each was examined with respect to the number of factors, the specific questionnaire items loading on the factors, and the magnitudes of the

test loadings. The items from the factors were then entered into an item analysis program and the quality of the individual items was examined with regard to the variance of responses across the 1-7 continuum, and item-subtest (item-factor) and item-total test correlations.

The above procedure was repeated with different factor solutions until the most meaningful solution was interpreted. This necessitated the exclusion of four questions (41, 49, 28, and 31) from the Modified MAQ. Questions 41 and 49 repeatedly loaded highly in the factor analysis (>.8) but loaded only with one another. The item analysis revealed that although both correlated highly (>.8) with the subtest, correlations were poor with the total test (≃.4). Thus, because these items were not contributing much to the total test, repeatedly loaded on a factor only by themselves, and did not exhibit clear meaning by themselves, they were deleted from the questionnaire in terms of all further analysis.

As mentioned above, items 28 and 31 were also deleted. For each factor solution they revealed low communalities ($h^2<2$) and low loadings on all factors. Even when their highest factor loadings were taken into consideration, the item content did not appear to fit meaningfully with the other items loading on the factors. In addition, the item analysis revealed low subtest and total test correlations for both questions.

Once these four questions were excluded, the 50 remaining questions were once again subjected to factor and item analyses. The factor analysis revealed four meaningful underlying factors, consistent with the output of four eigenvalues greater than 1. Close examination of the content of the questions loading on the factors revealed that they appeared to be measuring the following aspects of conception and pregnancy: Personal Benefits, Readiness, Physical Aspects, and

Convenience. The first three are consistent with those interpreted in the pilot study. However, most of the questions from the pilot results which loaded on a factor appearing to measure Maternal Instinct (the affective aspects of childbearing and parenting) loaded in the present study on the first factor, Personal Benefits. Additionally, a previously unidentified factor, Physical Aspects, emerged from the current data. This difference might be accounted for by the age differences between the pilot study sample and the present study sample: first-year university versus junior- and senior-high school students.

As described in chapter III, because mean scores rather than factor scores were used for subsequent data analysis, the term "subtest" replaces the term "factor". Thus, the following test names will be used for the interpretation and discussion of results: Maternal Motivation (Total Test), Personal Benefits (Subtest 1), Readiness (Subtest 2), Physical Aspects (Subtest 3), and Convenience (Subtest 4). A breakdown of the subtests is included in Appendix G.

The items from these four subtests were entered into the item analysis program. This program produces a Hoyt's ANOVA estimate of test reliability for each subtest and for the Total Test. Respectively, the computation revealed the following coefficients: .95, .87, .89, .89, and .96. In addition to computing a Hoyt's ANOVA for the Total Test, the program revealed a Cronbach's alpha of .75. Both the Hoyt's ANOVA and Cronbach's alpha are estimates of reliability, and the coefficients provided for the instrument used in the present research, then, indicate that there is evidence for internal consistency (homogeneity of test items).

Finally, statistics were computed for each individual for the Total Test and each of the subtests. Table 1 includes the means, the standard deviations, and the ranges of individual means across the 1-7 response continuum.

Discussion

The goal of this research question was to obtain information regarding adolescent females' attitudes toward pregnancy and parenthood. The factor analysis revealed that the responses to the Modified Maternal Attitude Questionnaire can be interpreted according to five components, the Total Test score and the scores on the four subtests. The means obtained, in order, of 2.75, 3.32, 3.05, 1.70, and 2.31, are all indicative of attitudes within the "undesirable" range of responses (1-3 on the response continuum). With respect to the subtests, the sample revealed slightly less undesirable attitudes toward the Personal Benefits and Physical Aspects of pregnancy and parenting than toward the Readiness and Convenience issues.

Although the attitudes tended to be undesirable when the overall sample was taken into account, the range of responses across the 1-7 continuum indicated that individuals varied in their responses. While the minimum responses were 1 (highly undesirable) for each test, the maximum responses ranged from 5.92 to 7, which is reflective of some individuals responding with "moderately" and "highly desirable" attitudes.

The generality of the nature of research question 1 does not allow for more specific response breakdowns. However, when the responses of subgroups of the sample are examined for the remaining research

Table 1

Means, Standard Deviations, and the Range[1] of Scores for the Tests and Subtests of the Modified Maternal Attitude Questionnaire

Test/Subtest	M	SD	Range
Total Test	2.75	1.12	1.00-5.92
Subtest 1: Personal Benefits	3.32	1.37	1.00-6.04
Subtest 2: Physical Aspects	3.05	1.68	1.00-7.00
Subtest 3: Readiness	1.70	0.92	1.00-6.30
Subtest 4: Convenience	2.31	1.25	1.00-7.00

Note. N = 330.
[1]Minimum and maximum individual means across the 1-7 ("highly undesirable" to "highly desirable") response continuum.

questions, more specific information will be revealed.

It should be noted, however, that while specifics cannot yet be addressed, the fact that the results so far indicate an overall undesirable attitude toward pregnancy and parenting during adolescence is an important finding. This is consistent with Scott's assertion that "for the most part, teenage pregnancies are reported as unintended" (1983, p. 889). National and regional studies in the United States determined that, consistently, fewer than one third of pregnancies were intended.

Furthermore, these results address the concerns of senior Alberta Community Health spokesmen (cited in Tretheway, 1987) that there is a lack of data regarding whether adolescents are becoming pregnant by choice or because of a lack of birth control information and use. For the 330 girls surveyed in the present study, the overall attitudes were not pro-pregnancy.

Additional implications from the present findings (from general information questions 5 and 6) relate to education and career goals. The vast majority of the girls in the sample expressed plans to complete high school (99.1%) and to continue their education afterward (74.2%). The frequencies presented in Appendix E indicate that 80% of the sample expressed specific career goals, and an examination of the specified goals revealed that the majority require training beyond high school, and a large number require a university education. Oettinger (1979), in an appeal for preventive programming (in terms of pregnancy), wrote that "apparently many of our teenagers are keeping their options open . . . have constructive plans for the future" (p. 162). The present results are consistent with this assertion.

Thus, a vital research goal is the attempt to discover why, if attitudes are generally undesirable and future education and career goals exist, adolescent girls are becoming pregnant and hindering the likelihood of fulfilling their dreams and goals. In chapter II, explanations were presented regarding why teenage girls put themselves at risk of becoming pregnant. In this study, the question, "In your opinion, why do teenage girls get pregnant?" (general information question 15), offered the opportunity for individual expression regarding this issue. As the results in Appendix F show, 32 categories of responses were formed, and the vast majority of these clearly do not include any reference to intended pregnancy. In fact, a great number of them refer to either a lack of knowledge or attempts to fulfill various types of unmet needs.

B. Question 2

What is the relationship between attitudes and cognitive level of response as per the questions scored according to the SOLO Taxonomy?

Results

Prior to the examination of the relationship between attitudes and the SOLO question responses, information is presented which relates specifically to the SOLO question responses. As explained in chapter III, five open-ended questions were scored according to the SOLO Taxonomy guidelines provided by Biggs and Collis (1982). These guidelines require categorization according to the number of relevant points, and their relationship with one another (if any), a process which enables the consequent categorization of the responses according to one of five levels (less to more complex in structure). Table 2 contains the frequency distribution of responses for both the number of relevant points and the levels scored. Table 3 presents the means, standard deviations, and the range of scores revealed for each question for both the number of relevant points scored and the levels obtained.

Scatterplots were computed to determine the relationship between age and the responses to each of the open-ended questions. The results revealed no relationships (curvilinear or linear) between age and SOLO level.

The numbers of Extended Abstract (Level 5) responses scored for the five questions, in order, are as follows: 6, 1, 1, 1, and 3. For questions 1 and 5, respectively, the ages (rounded to the nearest year) of the subjects who responded at this level ranged from 15-18 (mean=16) and 16-17 (mean=16.53). The girls who gave Level 5 responses to

Table 2

Frequency Distributions of the Relevant Points and Levels of the Responses to the Questions Scored According to the SOLO Taxonomy[1]

Question[2]	Relevant Points[3] #	Relevant Points[3] n	SOLO Level[4] #	SOLO Level[4] n
1. Re effect on teen's life	0	1	1	1
	1	22	2	22
	2	43	3	210
	3	83	4	91
	4	72	5	6
	5	37		
	6	37		
	7	17		
	8	11		
	9	3		
	10	1		
	11	2		
	12	-		
	13	1		
2. Re personal benefits	0	56	1	56
	1	93	2	93
	2	89	3	161
	3	58	4	19
	4	26	5	1
	5	3		
	6	4		
	7	1		
3. Re readiness	0	13	1	13
	1	53	2	53
	2	68	3	242
	3	85	4	21
	4	61	5	1
	5	31		
	6	10		
	7	4		
	8	2		
	9	-		
	10	1		
	11	2		

Table 2 (continued)

Frequency Distributions of the Relevant Points and Levels of the Responses to the Questions Scored According to the SOLO Taxonomy[1]

Question[2]	Relevant Points[3] #	Relevant Points[3] n	SOLO Level[4] #	SOLO Level[4] n
4. Re emotional attractiveness	0	52	1	52
	1	98	2	98
	2	81	3	166
	3	63	4	13
	4	22	5	1
	5	12		
	6	-		
	7	2		
5. Re convenience	0	27	1	27
	1	90	2	90
	2	89	3	187
	3	59	4	23
	4	31	5	3
	5	24		
	6	7		
	7	1		
	8	2		

Note. N = 330.
[1]See page 82 for a description of the relationship between the number of relevant points scored and the SOLO level designations.
[2]Abbreviated versions - see Appendix B for the full questions.
[3]Possible number of relevant points = any.
[4]Possible range for levels = 1-5.

Table 3

Means, Standard Deviations, and the Range[1] of Scores for the Questions Scored According to the SOLO Taxonomy

Question[2]	M	SD	Range
Number of Relevant Points			
1. Re effect on teen's life	4.03	1.97	0-13
2. Re personal benefits	1.80	1.33	0- 7
3. Re readiness	2.97	1.71	0-11
4. Re emotional attractiveness	1.85	1.36	0- 7
5. Re convenience	2.29	1.54	0- 8
Levels			
1. Re effect on teen's life	3.24	0.61	1-5
2. Re personal benefits	2.44	0.85	1-5
3. Re readiness	2.83	0.61	1-5
4. Re emotional attractiveness	2.43	0.81	1-5
5. Re convenience	2.65	0.77	1-5

Note. N = 330.
[1]Minimum and maximum observed scores. Possible number of relevant points = any. Possible range for levels = 1-5.
[2]Abbreviated versions - see Appendix B for the full questions.

questions 2, 3, and 4 were all 16 years of age.

The five SOLO questions were designed, based on the pilot data, such that one would assess overall maternal motivation and thus be compared with the total attitude test score, and the other four would relate to the four attitude subtests. However, factor analyses of the thesis data revealed a subtest not found from the pilot data (Physical Aspects) and one revealed by the pilot data was not found from the current data (Emotional Attractiveness). Thus, all intended comparisons were not possible.

The analysis of the relationship between attitudes and the SOLO question responses involved several statistical procedures. Scatterplots were produced to assess the relationships between the number of relevant points attained on each of the SOLO questions and the attitude (Total Test and subtests) scores. The analyses of primary interest with regard to the study, however, are those providing information about the correspondence between the attitude tests and SOLO questions assessing dimensions (affective/cognitive) of the same issues regarding maternal motivation. Two types of statistical analysis were conducted to answer this question. First, mean scores were compared using ANOVAs (attitude test by SOLO question) and MANOVAs (subtests by SOLO question). Next, the independence of the variables was assessed using chi-square tests.

As previously mentioned, scatterplots were produced to determine whether the number of relevant points attained on the open-ended questions (see Table 2 for the applicable ranges of relevant points) related to any of the Total Test/subtests attitude scores. No relationships (curvilinear or linear) were found for any of the combinations.

Tables I-1 to I-4 (Appendix I) contain the summary statistics for the ANOVAs to be interpreted here. Because of small n's, responses at Levels 1 and 5 for SOLO question 1, and Level 5 for questions 2-5 were excluded from the statistical analysis.

The ANOVAs of relevance to the research question are those assessing the mean differences for the following pairs of attitude tests and SOLO questions: Total Test by SQ1 (re the effect of pregnancy on a teenage girl's life), Personal Benefits subtest by SQ2 (re personal benefits), Readiness subtest by SQ3 (re readiness), and Convenience subtest by SQ5 (re convenience). These pairs were designed to be assessed in relation to one another.

The obtained F values are not significant for the first two pairs of variables: effect of pregnancy on a teenage girl's life, and personal benefits regarding pregnancy and parenthood. Thus, in both cases, girls with different levels on the SOLO questions did not respond with significantly different attitudes on the attitude tests.

For the pairs of variables measuring readiness and convenience, the observed F values are significant at the .01 level. Thus, for each of these aspects of pregnancy and parenting, attitudes differed for groups with different obtained levels on the related SOLO questions. The mean scores from these analyses are presented in Tables 4 and 5. In terms of readiness for pregnancy and parenthood, Scheffe tests revealed significant differences between the mean scores for responses at Levels 2 and 3 ($\rho \leq .05$). Thus, while girls responding at all four SOLO levels indicated negative attitudes regarding readiness, those with Multistructural responses (Level 3) responded significantly more negatively than those with Unistructural (Level 2) answers. As

Table 4

Comparison of Mean Attitude Scores (Subtest 3: Readiness) for SOLO Question 3 (Re Readiness)

SOLO Level	n	M	SD	Range
1. Prestructural	13	1.83 ab	0.98	1.00-3.73
2. Unistructural	53	2.04 a	0.91	1.00-4.36
3. Multistructural	242	1.60 b	0.85	1.00-6.18
4. Relational	21	1.98 ab	1.34	1.00-6.30

Note. N = 329; SOLO question Level 5 (Extended Abstract) was excluded from the analysis due to a small n (1).
Possible range of responses = 1-7.
Means with different letters are significantly different at $p \leq .05$.

Table 5

Comparison of Mean Attitude Scores (Subtest 4: Convenience) for SOLO Question 5 (Re Convenience)

SOLO Level	n	M		SD	Range
1. Prestructural	27	3.16	a	1.49	1.00-6.11
2. Unistructural	90	2.15	b	1.22	1.00-6.88
3. Multistructural	187	2.26	b	1.20	1.00-7.00
4. Relational	23	2.31	ab	0.97	1.00-4.67

Note. N = 327; SOLO question Level 5 (Extended Abstract) was excluded from the analysis due to a small n (3).
Possible range of responses = 1-7.
Means with different letters are significantly different at $\rho \leq .01$.

previously mentioned, only one student gave an Extended Abstract (Level 5) response, and thus this level was excluded from the analysis.

Regarding the convenience aspect of pregnancy and parenting, Scheffe tests revealed significant differences between the mean scores for responses at Levels 1 and 2, and Levels 1 and 3 ($\rho \leq .01$). While all means were representative of negative attitudes, girls who provided Prestructural (Level 1) answers to this SOLO question felt significantly less negatively about convenience issues than those who gave Unistructural (Level 2) and Multistructural (Level 3) answers. As with the readiness issue, Level 5 responses were excluded from the analysis due to a small n (3).

Tables J-1 to J-5 (Appendix J) contain the summary statistics for the MANOVAs. As in the case of the ANOVAs, responses at Levels 1 and 5 for SOLO question 1, and Level 5 for questions 2-5 were excluded from the analyses due to small n's. The obtained multivariate F for SOLO question 4 (regarding emotional attractiveness) was significant at the .055 level and could, with caution, have been interpreted. However, the univariate test results show no significance for any of the attitude subtests. A significant multivariate F value was observed for SOLO question 5 which addressed convenience issues ($\rho \leq .01$), and an examination of the univariate test results reveals that the differences between levels occur on Subtest 4, Convenience ($\rho \leq .01$). The reader is referred to Table 5 for the mean scores from this analysis, as they are identical to those obtained from the ANOVA for the same variables.

Scheffe tests comparing the means from Subtest 4 reveal that the differences occur between SOLO responses at Levels 1 and 2, and Levels 1 and 3 ($\rho \leq .01$). Thus, while negative attitudes were expressed toward

convenience issues of pregnancy and parenthood for all SOLO levels, those providing Unistructural (Level 2) and Multistructural (Level 3) answers to the question revealed less negative attitudes than those providing Prestructural (Level 1) responses.

While the univariate and multivariate analyses of variance provide an assessment of the attitude/cognition relationship from the perspective of a comparison of mean scores, an additional approach to analysis was also taken. Chi-square tests of independence, which take into account the variability of the distributions and assess whether or not variables are independent of one another, were conducted for combinations of attitude tests and SOLO questions.

In order to increase the number of expected frequencies per cell for the chi-square analyses, the attitude test scores (range = 1-7) were grouped according to one of two categories: those below 4 and those 4 and above. The results of the chi-square tests are presented in Table 6.

The significance levels reveal that for both the Total Test and Subtest 3, Readiness, the hypothesis that the distributions of attitude scores and level of response on the SOLO questions are the same should be accepted. The null hypothesis (that the distributions are the same) should be rejected for the other subtests. These results, indicate, then, that subjects with differing SOLO levels responded with different attitudes on Subtests 1 (Personal Benefits), 2 (Physical Aspects), and 4 (Convenience), and that responses did not vary with SOLO level on the Total Test or Readiness subtest.

While the subtests and SOLO questions were paired such that the issues they are purported to measure are the same, there are two exceptions to this categorization. The chi-square values are significant

Table 6

Results of the Chi-Square Analyses: Attitude Tests by Questions Scored According to the SOLO Taxonomy

Test Subtest	SOLO q	n	X^2	df	ρ
Total Test	1	323	0.60	2	.74
Personal Benefits	2	329	8.40	3	.04
Physical Aspects*	2	329	9.49	3	.02
Readiness	3	329	3.28	3	.35
Convenience*	3	329	9.59	3	.02
Convenience	5	327	10.74	3	.01

Note. SOLO questions: 1 is re effect of pregnancy on a teenage girl's life, 2 is re personal benefits, 3 is re readiness, 4 is re emotional attractiveness, and 5 is re convenience.
SOLO question 1 responses at Levels 1 and 5, and questions' 2-5 responses at Level 5 were excluded due to small n's.
* denotes analyses where the variables were not designed to correspond but significant results were obtained.

for the crosstabulations of Subtest 2 (Physical Aspects) with SOLO question 2 (re personal benefits), and Subtest 4 (Convenience) with SOLO question 3 (re readiness), and thus are included in Table 6.

Regardless of significance, the row totals for each attitude test reveal the pattern that students responding at all SOLO levels responded with more negative than neutral or positive attitudes toward the issue being assessed. For the tests, in the same order as the crosstabulations presented in Table 6, the percentage of attitude scores less than 4 on the 1-7 continuum are as follows: 87.0, 62.3, 69.9, 96.7, 88.4, and 88.7.

Discussion

The data from this research question provided qualitative information regarding the students' understanding of the issues related to pregnancy and parenting which were addressed in the attitude questionnaire. In addition, the relationships between this understanding and attitudes were assessed.

The frequency distribution of responses to the SOLO questions (presented in Table 2) shows that for each question the largest number of responses were provided at the multistructural level (Level 3) with the numbers tapering off toward both Levels 1 and 5. Level 3 thought is comparable to Piaget's "middle concrete" developmental stage. Although the obtained distribution of responses is not consistent with Piaget's assertion that formal operational thought emerges between 11 and 15 years of age (Sarafino & Armstrong, 1986), it is consistent with the results of other research which indicates that few students in the age range included in this study would be expected to provide higher level

responses (Danner & Day, 1977; Dulit, 1972; Higgens-Trenk & Gaite, 1971; Martorano, 1977; Neimark, 1975; Sarafino & Armstrong, 1986).

Biggs and Collis (1982), with their focus on the quality of learning, might explain that few higher level responses were observed on these tasks due to the interference of endogenous factors with performance at the maximum potential level. To elaborate, the students' performance on these particular tasks at the time of testing could have been influenced by the interaction of a number of factors, including motivation, developmental stage, prior knowledge of the topic, alertness, the presence of other students in the testing room, understanding of the task, and perhaps the fact that testing of a sensitive topic was taking place in a school setting. That only one response was observed at Level 1 on SOLO question 1 is likely because of the general nature of the question - it was not difficult to provide at least one relevant point and thereby receive a Level 2 score.

Interestingly, and consistent with the above explanation, age was not found to be related to level of response. The Level 5 responses were provided by girls ranging in age from 15 to 18 years. A relationship might have been present had the age range of the subjects been greater. There were few 18- and 19-year-olds in the sample and this, combined with the fact that they were in Grade 11 at the time of testing, may account for the absence of higher level responses from students in this age group.

With regard to the relationships between attitudes and the SOLO question responses, there were no clear patterns regarding the significant/nonsignificant findings. However, the fact that significance was observed for several comparisons supports the importance of studying

cognition in an attitude study and shows that the SOLO Taxonomy is a meaningful analysis technique in this context. The use of the taxonomy for scoring responses to questions on which direct instruction was not received by the students, as well as its use in assessing relationships with attitudes was exploratory in nature.

Overall, the SOLO Taxonomy provided a means of qualitatively evaluating the knowledge of the students on the issues tested via their written responses to questions, and the results of the analyses suggest that it is a promising research technique for inclusion in this type of study. The full usefulness of the obtained data, in terms of statistical comparisons, was not realized due to the narrow age range of the students in the sample, the unequal numbers of responses received at the different SOLO levels, and perhaps most importantly, the clustering of mean scores toward the negative end of the attitude scale.

C. Question 3

What is the relationship between attitudes and age?

Results

As outlined in chapter III when the sample was described, the students ranged in age from 14 to 19 years (mean=15.88, SD=0.92) at the time of the study. The frequency distribution of ages (rounded to the nearest year) is presented in Table 7. Because the data were collected at the end of the school year from students in Grades 9-11, it can be seen from the frequencies that the numbers of younger and older students taper off. This would be expected as there would be few 14-year-olds at the end of the Grade 9 school year, and the number of 18- and 19-year-olds in Grade 11 would be low.

The relationship between attitudes and age was examined using the following statistical procedures: scatterplots (Total Test and subtests), chi-square tests of independence (Total Test and subtests), an ANOVA (Total Test by age), and a MANOVA (subtests by age). The results of these analyses are as follows.

Scatterplots of the ages with the Total Test attitude score and with each of the four subtest scores were computed. There were no discernable relationships (curvilinear or linear) between the variables.

For the purpose of further analysis of the data, the two lower and the two upper age groups were combined in order to increase the number of observations in each of the groups. Thus, the four age groups for further study consisted of the following: 14- and 15-year-olds (n=127), 16-year-olds (n=120), 17-year-olds (n=70), and 18- and 19-year-olds (n=13). An examination of the ages calculated to two decimal points

Table 7

Frequency Distribution of Ages

Age[1]	n	%
14	9	2.7
15	118	35.8
16	120	36.4
17	70	21.2
18	12	3.6
19	1	0.3

Note. N = 330.
[1]Rounded to the nearest year.

revealed that these groupings should be appropriate. The ages for the nine 14-year-olds in the study were within 17 decimal points of rounding distance of 15 years of age, and the one 19-year-old had turned 19 only 2 weeks before the study was conducted. Additionally, the combinations are conceptually sensible as the students were at the end of the school year when the survey was conducted, and thus the first three age groups would be fairly characteristic of students completing Grades 9-11 and the final group would represent those students somewhat older than typical for Grade 11.

For the purpose of the chi-square analyses, the attitude test scores (range = 1-7) were grouped according to one of two categories: those below 4 and those 4 and above. This was to increase the number of expected frequencies per cell as tests using more categories revealed that 29 to 50% of the cells had expected values less than 5. The chi-square values and the observed significance levels from the analyses are presented in Table 8.

The significance levels reveal that only for Subtest 1, Personal Benefits, should the null hypothesis that age and attitude scores are from the same distribution be rejected. The null hypothesis should not be rejected for the other tests. These results indicate, then, that age groups responded differently on Subtest 1 and that responses did not differ on the Total Test or Subtests 2-4.

Regardless of significance, the row totals for each test reveal the pattern that the students in all four age groups responded with more negative than neutral or positive attitudes. For the Total Test and subtests, in order, the percentage of scores less than 4 on the 1-7 scale are as follows: 86.7, 62.4, 70.0, 96.7, and 88.5.

Table 8

Results of the Chi-Square Analyses: Attitude Tests by Age Groups[1]

Test/Subtest	X^2	df	p
Total Test	7.16	3	.07
Subtest 1: Personal Benefits	8.17	3	.04
Subtest 2: Physical Aspects	2.21	3	.52
Subtest 3: Readiness	2.96	3	.40
Subtest 4: Convenience	5.39	3	.15

Note. N = 330.
[1]Age groups: <16 years, 16 years, 17 years, >17 years.

Table I-5 (Appendix I) presents the summary statistics for the univariate analysis of variance. The obtained F value is significant at the .05 level and the mean scores from the analysis are contained in Table 9. Subsequent Scheffe tests revealed that 18- and 19-year-old girls responded significantly more positively than 17-year-olds ($\rho \leq .10$). It must be noted, however, that the mean score for the former group is still closer to the "slightly undesirable" than the "neutral" response option on the questionnaire.

The summary statistics for the multivariate analysis of variance (age by subtests) are contained in Table J-6 (Appendix J). The observed multivariate F value is significant at the .056 level, and although the minimum criterion for an F value to be interpreted is set at the .05 level, the value is close and thus, with this acknowledgement of the usual procedure and subsequent caution, the test results will be interpreted. Given, then, that the hypothesis of no difference will be rejected, an examination of the univariate test results shows that differences among age groups occurs only for the first subtest ($\rho \leq .01$). According to the results of Scheffe tests performed on pairs of means from this subtest (see Table 10), the 14- and 15-year-olds responded significantly more positively (within rounding distance of "neutral") than the 17-year-olds ($\rho \leq .05$). Thus, these groups of students indicated different attitudes regarding Personal Benefits with the latter responding more negatively than the former.

Discussion

This research question was included in order to determine whether there was any relationship between the participants' ages at the time of

Table 9

Comparison of Mean Attitude Scores (Total Test) for Age Groups

Age Group	n	M		SD	Range
<16 years	127	2.84	ab	1.07	1.00-4.84
16 years	120	2.75	ab	1.13	1.00-5.92
17 years	70	2.46	a	1.13	1.00-5.02
>17 years	13	3.34	b	1.08	2.02-5.22

Note. N = 330. Possible range of scores = 1-7.
Means with different letters are significantly different at $p \leq .10$.

Table 10

Comparison of Mean Attitude Scores (Subtest 1: Personal Benefits) for Age Groups

Age Group	n	M		SD	Range
<16 years	127	3.48	a	1.35	1.00-5.70
16 years	120	3.35	ab	1.39	1.00-6.04
17 years	70	2.88	b	1.36	1.00-5.65
>17 years	13	3.93	ab	1.03	2.35-5.65

Note. N = 330. Possible range of scores = 1-7.
Means with different letters are significantly different at $p \leq .05$.

the survey and their attitudes.

Girls in all age groups (<16 years, 16 years, 17 years, >17 years) responded with more negative than neutral or positive attitudes on the attitude tests. This finding is consistent with the results of research question 1, where it was found that responses for the sample as a whole were negative.

Perhaps because of the clustering of attitudes at the negative end of the attitude scale, although age did exert a significant effect on some attitude tests, the results are more meaningful when trends are interpreted.

Thus, with regard to trends observed regardless of statistical significance, the mean scores on all attitude tests become increasingly more negative as age increases across the first three age groups. The small number of respondents within the oldest age group as well as the narrow range of responses provided may account for why this group's scores were not a clear part of the observed pattern.

The results revealed that age exerted a significant effect for attitudes on the overall test as well as on Subtest 1, Personal Benefits. With regard to the former, 17-year-olds responded with more negative attitudes than 18- and 19-year-olds. On Subtest 1, 17-year-olds responded more negatively than 14- and 15-year-olds. Thus, the 17-year-olds, as a group, felt more negatively about overall maternal motivation than the oldest girls in the sample, and more negatively about the Personal Benefits aspects of pregnancy and parenthood than the youngest girls. It is possible that the younger girls found the Personal Benefits not entirely negative, but when the benefits were combined with the other aspects of pregnancy and parenting (Physical Aspects,

Readiness, and Convenience), this changed. Perhaps with increasing age there is an associated increase in the following: amount and nature of sex education, capacity to meet love and esteem needs in non-sexual ways, and focus on future orientation. Whether more significant differences would be obtained if there was a greater age range is unknown. However, before it is assumed that age is not an influential factor in determining attitudes, further testing is recommended.

D. Question 4

What is the relationship between attitudes and sexual knowledge?

Results

Before a description of the results with respect to the above relationship is provided, information regarding the students' sexual knowledge will be presented. The information was obtained from frequency distributions of responses to selected questions from the measure of sexual knowledge and sexual behavior.

In order to obtain an estimate of the girls' opinions regarding what teenagers know about sex, they were asked to respond "yes," "no," or "don't know" to question 2: "Teenagers think they know more about sex than they really do." Interestingly, 211 (63.9%) of the girls responded "yes," 58 (17.6%) responded "no", and 61 (18.5%) responded with "don't know".

As explained in chapter III, the Reproductive Physiology Test (RPT) consists of items 3 through 13 of the Sexual Knowledge Questionnaire. For the total sample of 330 students, the number of correct answers (out of a possible total score of 11) ranged from 1 to 11. The mean number of correct answers was 6.42 (SD=2.2).

Just less than half of the group, 45.8%, received scores between 1 and 6. Scores of 10 and 11 (high scores) were received by only 19 girls (5.8% of the sample), and scores of 1 and 2 (low scores) were obtained by 18 girls (5.5% of the sample). The girls who scored at the upper end and those who scored at the lower end all ranged in age from 15 to 17 years. The means, respectively, were 16.32 and 15.61.

The age groups with the smallest total numbers were comprised of the youngest and the oldest students. Two groups, the 14-year-olds (n=9) and the 18-year-olds (n=12), received scores ranging from 3 to 9 out of 11. The mean scores, in order, were 6.89 and 6.00. The one 19-year-old in the sample answered 7 items correctly.

As Meikle et al. (1985) stressed, "while the total RPT score gives a useful overall impression of teenagers' sexual knowledge, of greater interest from the point of view of prevention is the detection of knowledge gaps" (p. 49). In their study in Calgary, and in this study, the individual RPT questions were examined independently. The results are presented in Table 11. The correct answer for each item is enclosed in parentheses following the item, and the frequencies and percentages of responses for the total samples for each study are provided. In Table 12, the percentages of correct total RPT scores are provided for the samples from the present research and from the Calgary study. While the overall knowledge of both groups is similar, no age-related patterns occurred for the Grande Prairie sample although the number of correct responses was found to increase significantly with age in the Calgary sample. It is important to note that while the Grande Prairie data represent responses from 330 females ranging in age from 14 to 19 years, the Calgary responses were from 809 females and males (approximately equal numbers of each sex) ranging in age from 13 to 18 years. The information from Tables 11 and 12 will be elaborated upon in the discussion section for this research question.

The relationship between attitudes and sexual knowledge was assessed using a scatterplot and a Pearson correlation coefficient, both calculated based on the Total Test attitude score and the total RPT

Table 11

Reproductive Physiology Test Item Frequencies and Percentages:

Grande Prairie (GP)[1] and Calgary[2] Studies

Test Item	Answer	GP		Calgary	
		n	%	n	%
3. The younger a girl is, the easier it is for her to get pregnant. (no)[3]	yes	51	15.5	102	12.6
	no	187	56.7	581	71.8
	dk	91	27.6	126	15.6
	nr	1	0.3	-	-
4. Is a girl physically capable of becoming pregnant before her first menstrual (monthly) period? (yes)[4]	yes	120	36.4	184	22.7
	no	154	46.7	485	60.0
	dk	56	17.0	140	17.3
5. A girl can become pregnant during her menstrual (monthly) period. (yes)	yes	212	64.2	381	47.1
	no	62	18.8	284	35.1
	dk	55	16.7	144	17.8
	nr	1	0.3	-	-
6. A girl is most likely to get pregnant the day after her menstrual (monthly) period. (no)	yes	69	20.9	201	24.8
	no	127	38.5	393	48.6
	dk	134	40.6	212	26.2
	nr	-	-	3	0.4
7. Sperm can live in the girl's reproduction system for about 72 hours (three days). (yes)	yes	224	67.9	381	47.1
	no	33	10.0	130	16.1
	dk	73	22.1	295	36.5
	nr	-	-	3	0.4
8. A girl can become pregnant without full intercourse taking place (going all the way). (yes)	yes	221	67.0	300	37.1
	no	74	22.4	443	54.8
	dk	35	10.6	62	7.7
	nr	-	-	4	0.5
9. Does a woman have to have an orgasm (climax) during intercourse before she can get pregnant? (no)	yes	12	3.6	131	16.2
	no	264	80.0	530	65.5
	dk	54	16.4	144	17.8
	nr	-	-	4	0.5

Table 11 (continued)

Test Item	Answer	GP		Calgary	
		n	%	n	%
10. Is there any age when a boy is old enough to have intercourse (go all the way) and not risk making a girl pregnant? (yes)	yes	63	19.1	274	33.9
	no	176	53.3	379	46.8
	dk	91	27.6	154	19
	nr	-	-	2	0.2
11. Are there periods in the month when a boy is not fertile (not able to make a girl pregnant? (no)	yes	14	4.2	62	7.7
	no	221	67.0	461	57.0
	dk	95	28.8	282	34.9
	nr	-	-	4	0.5
12. Does a boy have a daily limit of sperm which can be exhausted with the result that he cannot get a girl pregnant thereafter? (no)	yes	19	5.8	112	13.8
	no	203	61.5	450	55.6
	dk	108	32.7	244	30.2
	nr	-	-	3	0.4
13. In general, the younger the girl the more damaging a pregnancy is to her physical health. (yes)	yes	277	83.9	639	79.0
	no	26	7.9	83	10.3
	dk	26	7.9	85	10.5
	nr	1	0.3	2	0.2

Note. dk = "don't know"; nr = no response.
[1]The dissertation research: N = 330 females ranging in age from 14 to 19 years.
[2]The research by Meikle et al. (1985) for which the Sexual Knowledge Questionnaire was designed: N = 809 females and males ranging in age from 13 to 18 years.
[3]The correct answers to each question are enclosed in parentheses following each item.
[4]Meikle et al. (1985) considered "no" to be the correct answer to this question but noted that there were opinions to the contrary. J. Peitchinis (personal communication, July 8, 1987) explained that she would consider the answer to be "yes". This opinion was confirmed by personnel at the Birth Control Clinic in Edmonton (personal communication, July 8, 1987).

Table 12

Reproductive Physiology Test Scores: Grande Prairie[1] and Calgary[2] Studies

RPT		Grande Prairie	Calgary
% correct for total sample		58.36	55.00
% correct for females		58.36	54.17
% correct for males		n/a	56.50
% correct by age:	13	n/a	47.92
(total sample)	14	62.64	50.50
	15	50.09	55.17
	16	63.73	62.17
	17	63.27	61.92
	18	54.55	60.00
	19	63.64	n/a

Note. n/a = age category not included in the research.
To enable comparisons, mean scores were converted to percentages because the maximum possible scores differed for the samples: Grande Prairie total possible = 11, Calgary total possible = 12.
[1]The dissertation research: N = 330.
[2]The research by Meikle et al. (1985) for which the questionnaire was designed: n = 809 (approximately equal numbers of females and males).

score. No discernable relationship between the variables (curvilinear or linear) was revealed by the scatterplot, and the Pearson r of .11 supports the absence of any linear relationship.

Discussion

The purpose of this research question was to assess the students' sexual knowledge and the nature of any relationship between this knowledge and their attitudes toward pregnancy and parenthood.

Less than one fifth of the sample felt that teenagers think they know more about sex than they really do. This suggests that the often-heard claim that "teenagers think they know it all" is grossly exaggerated, at least for the girls in this sample.

The test item frequencies and percentages summarized in Table 11 reveal the variability of correct responses for both the samples for which data are presented. The percentage of correct responses ranges from 19.1 to 83.9 for the Grande Prairie sample and from 22.7 to 79.0 for the Calgary sample. For comparison purposes, Meikle et al. (1985) collected data from samples of nursing students, community nurses, female medical students, female biology students, male biology students, and post-abortion patients, and discovered that mean scores were quite low (ranging from 6.6 to 9.7 out of a possible total of 12) and that the individuals within the groups were highly variable in their knowledge. They concluded that the average high school student's knowledge was similar but stressed, however, that "in absolute terms this is not particularly reassuring since none of the groups comes off particulary well" (p. 55). The data collected from teenagers in Calgary revealed that those students who had been exposed to sex education programs

performed only "slightly better than those who had not" (p. 57).

According to Meikle et al., the RPT items vary in their significance and the most critical misinformation "is that which leads couples to engage in intercourse in the mistaken belief that they are in fact protected" (p. 55). Of the 11 RPT items administered in the present study, items 5, 6, 8, 9, and 11 are critical with regard to the above, and to a lesser extent, items 4 and 10. For one of the five most critical questions, fewer than 50% of the sample knew the correct answer. For three of the four remaining questions, 64.2 to 67% of the girls provided correct answers and for the other item 80.0% were right. The students in this survey provided more correct answers to these questions than those in the Calgary sample, where for three of the questions, fewer than 50% knew the correct answers and for the remaining two items, 57 to 65.5% were correct. Far fewer than 50% of the girls in both studies knew the correct answers to items 4 and 10.

Given that one third of the girls in the Grande Prairie sample indicated they were sexually active (see research question 5) and the amount of sexual knowledge demonstrated on the RPT, in the words of Meikle et al., "the risks of unwanted pregnancies seem alarmingly clear" (p. 56). They expressed serious concern at their finding that knowledge gaps exist also in "professional groups such as nursing and medical students, who might normally be expected to be familiar with these matters" (p. 57).

With respect to sexual knowledge, then, the results of the current study are consistent with the data collected by Meikle et al. in Calgary, and address the concerns of Murdock (cited in Tretheway, 1987) that perhaps Alberta adolescents lack information about birth control.

There are tremendous implications for the education of students - according to these studies they are not adequately equipped with the knowledge necessary for the prevention of pregnancy. The risks fall into two categories: those who are sexually active are at risk for pregnancy, and misinformation is likely being communicated among peers.

Finally, that no statistical relationship was observed between sexual knowledge and attitudes may be because of the narrow range of RPT scores and the clustering of attitudes toward the negative end of the scale. More variation in the scores might have allowed for more significance. An alternative possibility is that sexual knowledge and attitudes are not related to one another in any statistically significant manner. Regardless of the explanation, perhaps the greatest value of the inclusion of the RPT in this study is in the valuable information it provides with regard to the sample's sexual knowledge.

E. Question 5

What is the relationship between attitudes and sexual behavior?

Results

As with research question 4, descriptive information obtained from frequencies and crosstabulations of responses to several questions on the measure of sexual knowledge and sexual behavior is presented before the comparison of attitudes and behavior is described. Questions 1, 14, 15, 16, and 17 provided information regarding the respondents' dating and sexual behaviors.

The students indicated the ages when they began dating boys by placing a check mark beside the appropriate one of five provided age ranges. The responses revealed that 31 (9.4%) began dating before 11 years of age, 123 (37.3%) between the ages of 11 and 13, 125 (37.9%) between the ages of 14 and 16, 2 (0.6%) between the ages of 17 and 19, and 47 (14.2%) had not yet dated (2 missing cases).

With respect to sexual behavior, questions were answered about sexual intercourse, use of birth control and pregnancy. When asked if they had experienced sexual intercourse, 116 (35.2%) of the girls reported that they had, and 214 (64.8%) reported that they had not. Half of those who said "yes" (n=58, 50.0%) reported using birth control for their first experience.

The type of birth control used was specified by 54 of the 58 girls who had responded affirmatively regarding having experienced sexual intercourse, and 4 of these girls listed the use of two kinds. The following statistics, then, were calculated with regard to an n of 54. Overall, the types used were the condom (n=38, 70.4%), foam/cream/jelly

(n=3, 5.6%), the birth control pill (n=15, 27.8%), and withdrawal (n=2, 3.7%).

A small increase was noted in the use of birth control when asked about the most recent experience with intercourse: 67 (57.8%) reported the use of birth control and 49 (42.2%) reported that none was used. Similar to above, 63 specified the type of birth control used and 5 indicated the use of a second type as well. Thus, the following statistics were calculated based on an n of 63. Interestingly, by the most recent experience, the types of birth control reported had changed in that more effective methods were being utilized. To elaborate, the types reported included only the condom (n=31, 49.2%) and the birth control pill (n=37, 58.7%).

The final question (17) asked that the participants indicate whether or not they had ever been pregnant. While 319 girls (96.7%) expressed that they had not, 11 (3.3%) responded affirmatively. The ages of these latter 11 were as follows: 15 years (n=2), 16 years (n=6), 17 years (n=2), and 18 years (n=1).

The relationship between attitudes and sexual behavior (revealed by SKQ items 14, 15, 16, and 17) was assessed using ANOVAs (Total Test by behavior) and MANOVAs (subtests by behavior). Separate analyses were conducted for each of the aforementioned SKQ items.

The summary statistics for the ANOVAs are presented in Tables I-6 to I-9 (Appendix I) and the mean scores from the analysis are contained in Table 13. For items 14 (intercourse experienced), 15 (birth control used for first experience with intercourse), and 17 (been pregnant), the observed F values are significant at the .01 level. In the case of item 16 (birth control used for most recent experience with intercourse), the

Table 13

Comparison of Mean Attitude Scores (Total Test) for Sexual Behavior (SKQ Items 14, 15, 16, and 17)

SKQ Item	n	M	SD	Range
14. Had intercourse:				
yes	116	3.10 a	1.09	1.00-5.92
no	214	2.55 b	1.08	1.00-5.66
15. BC (first time):				
yes	58	2.83 a	1.15	1.00-5.86
no	58	3.42 b	0.97	1.20-5.92
16. BC (recent time):				
yes	67	2.97 a *	1.16	1.06-5.86
no	49	3.33 b*	0.98	1.00-5.92
17. Ever pregnant:				
yes	11	3.86 a	0.96	2.46-5.92
no	319	2.71 b	1.10	1.00-5.86

Note. N = 330 for items 14 and 17; n = 116 for items 15 and 16 (those who responded affirmatively to item 14).
Possible range of scores = 1-7. BC = birth control.
Pairs of means with different letters are significantly different at $p \leq .01$; * denotes significantly different at $p \leq .10$.

F value is significant at the .10 level. Although all mean scores are representative of undesirable attitudes regarding overall maternal motivation, most were within rounding distance of "slightly undesirable" and one was closer to "neutral." For questions 14 and 17, those who responded affirmatively reported less negative attitudes than those who responded otherwise. For questions 15 and 16 the opposite was revealed.

The summary statistics for the MANOVAs are presented in Tables J-7 to J-10 (Appendix J). The observed multivariate F values are significant for SKQ items 14, 15, and 17. Because each question involved the comparison of attitude subtest scores for only two groups (yes/no responses), any differences between groups were revealed by the MANOVA data and thus Scheffe tests were unnecessary.

For question 14, the multivariate F statistic is significant at the .01 level and the univariate test results show that the differences between groups occurred on all four attitude subtests ($\rho \leq .01$) (see Table 14 for the mean scores). In each case, those subjects who had not experienced sexual intercourse responded with significantly more negative attitudes than those who had.

The multivariate F value for item 15 is significant at the .05 level and an examination of the univariate test results reveals that the groups differed on all subtests ($\rho \leq .01$ for Subtest 3 and $\rho \leq .05$ for the other subtests). The mean scores from the analysis are presented in Table 15. In each case, those girls who reported using birth control for their first experience with sexual intercourse responded with significantly more negative attitudes than those who did not use birth control. As aforementioned, no significance was obtained for item 16. Thus, girls who reported using birth control for their most recent

Table 14

Comparison of Mean Attitude Scores (Subtests) for Sexual Intercourse (SKQ 14)

Subtest	SKQ 14 Response	n	M	SD
Personal Benefits	yes	116	3.72 a	1.27
	no	214	3.10 b	1.38
Physical Aspects	yes	116	3.48 a	1.71
	no	214	2.82 b	1.61
Readiness	yes	116	1.93 a	1.06
	no	214	1.58 b	0.80
Convenience	yes	116	2.67 a	1.34
	no	214	2.12 b	1.15

Note. For each subtest, N = 330. Possible range of scores = 1-7. For each subtest, means with different letters are significantly different at $p \leq .01$.

Table 15

Comparison of Mean Attitude Scores (Subtests) for Use of Birth Control for First Sexual Experience (SKQ 15)

Subtest	BC Used	n	M	SD
Personal Benefits	yes	58	3.45 a	1.33
	no	58	4.03 b	1.13
Physical Aspects	yes	58	3.13 a	1.77
	no	58	3.87 b	1.60
Readiness	yes	58	1.67 a *	0.95
	no	58	2.22 b*	1.12
Convenience	yes	58	2.41 a	1.45
	no	58	2.97 b	1.18

Note. For each subtest, n = 116 (those who had experienced sexual intercourse). Possible range of scores = 1-7.
BC = birth control.
For each subtest, means with different letters are significantly different at $p \leq .05$; * denotes means significantly different at $p \leq .01$.

sexual experience and those who indicated the use of no birth control did not differ significantly on their responses for any of the subtests. Finally, the multivariate F statistic for item 17 is significant at the .01 level and the univariate test results showed that the groups differed on all subtests ($\rho \leq .01$ for Subtests 1, 3, and 4, and $\rho \leq .05$ for Subtest 2). The mean scores are presented in Table 16.

It can be seen that even though the number of girls who reported having been pregnant is small (n=11), they responded with significantly less negative attitudes than the remainder of the sample (n=319). For the Personal Benefits subtest, their mean score is within rounding distance of the "slightly desirable" response option, and for the Physical Aspects and Convenience subtests, the means are closer to "neutral".

Discussion

The intent of this research question was to obtain information about the respondents' behavior and to assess whether or not the behavior was related to attitudes.

Dating, while not necessarily sexual in nature, certainly serves as a prelude to possible sexual involvement. The data from the present study reveals that many of the girls began dating at an early age - by the age of 13 years, 47% had dated. This is consistent with research results described by Meikle et al. (1985) in which the following was found: sexually active high school girls dated more frequently than those not sexually active, 13.5 years was the average age for the commencement of dating in a study of 1,000 pregnant adolescents, and 13 years 9 months was the average age for the beginning of dating in a

Table 16

Comparison of Mean Attitude Scores (Subtests) for Pregnancy (SKQ 17)

Subtest	Ever Pregnant	n	M	SD
Personal Benefits	yes	11	4.53 a	0.74
	no	319	3.28 b	1.37
Physical Aspects	yes	11	4.23 a *	1.44
	no	319	3.01 b*	1.67
Readiness	yes	11	2.54 a	1.66
	no	319	1.67 b	0.87
Convenience	yes	11	3.51 a	1.66
	no	319	2.27 b	1.22

Note. For each subtest, N = 330. Possible range of scores = 1-7. For each subtest, means with different letters are significantly different at $p \leq .01$; * denotes means significantly different at $p \leq .05$.

sample of 738 unmarried 15- to 19-year-olds. Also mentioned are two studies involving samples of college students. One researcher found that among males, early commencement age of dating was related to early sexual initiation as well as a greater likelihood of later involvement with multiple partners. The results of another study using females and males as respondents revealed a positive correlation between the frequency of dating and the degree of sophistication of sexual activities. According to these studies, then, it is apparent "that dating, with its attendant likelihood of other heterosexual activity, begins quite early in life" (Meikle et al., p. 43).

About one third (35.2%) of the students in the present study claimed to have had sexual intercourse. This is consistent with data obtained in Calgary by Meikle et al. (32.39% of females and males), with other research results described by these authors (33% and 38%), as well as with data presented by DeWaal (1982), who indicated that nearly one third of Alberta teens had had intercourse (17% at age 13, increasing to 67% by age 18). Similarly, Meikle et al. found an increase in the likelihood of intercourse with increasing age, 16.6% at age 13 to 66.7% by age 18, and found that the pattern of this increase suggests that adolescents are most likely to begin having sexual intercourse during the age periods between 15 and 16 years and between 17 and 18 years.

In the current study, half (50%) of the 116 sexually experienced girls reported using birth control for their first sexual experience and slightly more than half (57.8%) said they did for their most recent experience. While the data revealed an increase in the protective nature of the birth control methods used by the most recent experience, still only about half of the girls who were sexually active were using birth

control, and for both their first and most recent experiences at least half of the methods used were unsafe with regard to pregnancy prevention. Those whose only means of contraception were the condom, foam/cream/jelly, or withdrawal were not protected. In comparison with the results of Meikle et al., the user rates of contraception are comparable: 53.9% for females during their first intercourse experience and 66.6% during their most recent experience. These authors also found that parental educational background was a significant factor in determining contraceptive use for the most recent occasion - "fewer of the lower and more of the medium and higher groups were users" (p. 60). The types of contraceptives reportedly used by teens in both studies were similar.

In the Calgary study, the most common reasons given for the non-use of contraceptives were as follows: unplanned intercourse, lack of knowledge regarding how to obtain or use contraceptives, and a belief the girl could not get pregnant. These reasons are consistent with the information reported by Guyatt (1974), Schneider (1982), and Smith et al. (1982) and described in chapter II of the dissertation.

That there is a correlation between early age at first intercourse and high risk of pregnancy, primarily due to the lack of use of birth control (Meikle et al., 1985; Planned Parenthood Federation of Canada, 1980) is cause for alarm when one considers the rates of unprotected sexual activity among teens. Teen-Aid of Edmonton District Association (1988) expressed concern about statistics showing that even with increased and more consistent use of contraceptives than in previous years, both the "number and rate of premarital pregnancies continues to rise" (p. 4).

The number of girls in the current study who responded affirmatively when asked if they had ever been pregnant was 11 (3.3% of the sample). This rate is lower than the 6.7% reported by Meikle et al., but comparable to statistics compiled by Bonham et al. (1987) for the various health unit regions in Alberta for 12- to 19-year-olds during the period of time from 1980 to 1985. In 1980 the birth rate for the South Peace region, which includes Grande Prairie, was 36 per 1000 females and by 1985 was 28 per 1000.

Caution is advised, however, when interpreting such statistics. While they are informative, the numbers obtained in the current study may be inaccurate for several reasons, including refusal to admit pregnancy on the questionnaire, in rare instances girls spontaneously abort without any knowledge of the pregnancy, and also, as explained by Meikle et al., the obtained figures are probably artifically low due to a tendency for pregnant teens to drop out of school or move to other schools.

The statistics presented by Bonham et al. (1987) were acquired from the Vital Statistics Annual Review and reveal that the birth rate for the South Peace district in 1985 was higher than rates for 19 Alberta regions, equal to the rate for 1 region, and lower than those in only 6 regions. For the total of 27 regions included, the rates ranged from 8 to 74 per 1000 females. It must be noted, however, that these numbers would not include pregnancies which were not brought to the attention of health authorities, were terminated spontaneously or intentionally, or cases where the girls left the South Peace region while pregnant.

There is a vast amount of information which could be written about this issue but in keeping with the intent of the research question, the relationship between sexual behavior and attitudes toward pregnancy and parenthood will be described. The above discussion is sufficient to address the extent and seriousness of adolescent sexual activity and the reader is referred to the authors mentioned therein as well as in chapter II for additional information.

With regard to overall maternal motivation, the mean scores were significantly different for those who responded affirmatively and those who did not regarding the four aspects of sexual behavior assessed: intercourse experienced, use of birth control for first experience, use of birth control for most recent experience, and pregnancy. Girls who had experienced sexual intercourse and those who had been pregnant had less negative attitudes, although in the latter case the mean score was within rounding distance of "neutral". Interestingly, those who used birth control for their first and most recent experiences with sexual intercourse felt significantly more negatively than those who did not.

Comparable results were obtained when attitudes toward the Personal Benefits, Physical Aspects, Readiness, and Convenience issues of pregnancy and parenting were examined individually for each of these behaviors. As above, sexually experienced girls had less negative attitudes toward all four issues and those who used birth control for their first experience had more negative attitudes than those who did not. Although there was no statistical significance observed for the use of birth control for the most recent experience, the same pattern was present in the scores - those who used contraceptives had more negative attitudes on all subtests. The girls who had been pregnant had

significantly less negative attitudes than those who had not (while the numbers of observations in each group are vastly different, even if statistical significance is ignored, this pattern is present for overall maternal motivation as well as all of the subtest issues).

Overall, then, girls who were sexually experienced or had been pregnant had less negative attitudes than those who were inexperienced, and those using birth control felt more negatively than those who had not. Possible explanations for these results are that teens who feel more negatively about possible pregnancy and parenting have chosen not to be sexually active, and perhaps those who are sexually active have either thought more about the potential consequences of their behavior or have more sexual knowledge than those who are not. Additionally, although they may or may not recognize the possibility of pregnancy, cognitive dissonance theory would suggest that their attitudes might be defined to be consistent with their behavior. That girls using birth control felt more negatively than those not using it is not surprising - likely the stronger desire not to become pregnant resulted in the use of preventive measures, however effective they may be. As previously indicated, however, there is a vital need for more education about and access to more effective contraceptives.

F. Question 6

Is there a relationship between attitudes and experience with teenage pregnancy and parenthood?

Results

General information questions 13 and 14 were included in order to gather data regarding each participants' experience with teenage pregnancy and parenthood. The questions asked, respectively, whether the girls knew anyone who became pregnant as a teenager, and anyone who became a mother as a teenager. Four more specific questions and a request for an explanation were included under each of these. Excluding the explanations, the results showed the following information (the number of missing responses is included at the end of each question and incorporates the following types of answers: "no" specified to the general question, unknown information, instances where both possible replies (yes/no) were checked, unscorable responses, and missing data). Only those who said "yes" to the general question were asked to answer the additional four questions.

With respect to question 13, 292 (88.5%) of the girls in the sample indicated that they knew someone who became pregnant as a teenager, while 38 (11.5%) said they did not. Thus, the following statistics were calculated with respect to an n of 292. The ages reported for when she became pregnant ranged from 12 to 19 years (mean=15.56, SD=1.22, 3 missing cases). When asked if she was married at the time she became pregnant, 7 (2.4%) responded affirmatively, and 285 (97.6%) responded negatively. Over half of the girls (n=184, 63%) knew the person well, and 107 (36.6%) did not (1 missing case). The pregnancy

was described as a "good" experience for the person by 106 (36.3%) girls, and a "bad" experience by over half of the group (n=169, 57.9%, 17 missing cases).

Similar questions were asked with regard to knowledge of anyone who had become a teenage mother. The majority of the sample (n=231, 70%) said that they did know someone, and 99 (30%) said they did not. The 231 who said "yes" reported that the mothers' ages when they gave birth ranged from 14 to 19 years (mean=16.28, SD=1.20, 3 missing cases). The following statistics were calculated based on the n of 231 who responded affirmatively. A small number, 15 (6.5%), were married at the time of conception and 216 (93.5%) were not, but by the time they gave birth, 46 (19.9%) were married and 184 (79.7%) were not (1 missing case). Over half of the girls who knew a teenage mother (n=138, 59.7%) claimed that they knew her well, and 92 (39.8%) said they did not (1 missing case). Finally, with regard to the nature of the experience for the mother, 138 (59.7%) said it was "good" and 92 (39.8%) described it as "bad" (1 missing case).

The relationship between attitudes and experience with pregnancy/parenthood was assessed using ANOVAs (Total Test by Experience) and MANOVAs (subtests by experience). As described earlier, each of general information questions 13 and 14 subsumed four more specific questions to be answered by those who responded affirmatively to 13 and 14. Only one of these specific questions, "Did you know the person well?", was included in the comparison with attitudes. Thus, the analysis involved questions 13, 13c, 14, and 14c from the general information questions. Separate analyses were conducted for each question and the results are as follows.

The summary statistics for the ANOVAs are contained in Tables I-10 to I-13 (Appendix I). Table 17 presents the mean scores for the analyses. For items 13 (knowledge of a pregnant adolescent) and 14 (knowledge of an adolescent mother), the obtained F values are significant at the .01 level. The F values are not significant for items 13c and 14c. Thus, while all means are representative of undesirable attitudes regarding overall maternal motivation, those girls who knew a pregnant teen and those who knew a mothering teen responded with significantly less negative attitudes than those who did not know a teen in either circumstance. No difference was observed for whether or not the respondents knew the girls in these situations well.

The summary statistics for the MANOVAs are presented in Tables J-11 to J-14 (Appendix J). Because the questions involved yes/no responses, significant differences between groups for the attitude subtest means is revealed by the MANOVA data and thus Scheffe tests were unnecessary.

The only significant multivariate F value was observed for item 14 ($\rho \leq .01$) and the univariate test results revealed that the differences between group means occurred on all four attitude subtests ($\rho \leq .01$). Table 18 contains the mean scores from this analysis. Although all mean scores represent "undesirable" attitudes, those girls who reported knowing an adolescent mother responded with significantly less negative attitudes for all four subtests than those who reported no knowledge of anyone who became a teenage mother. No significance was obtained for questions 13, 13c, and 14c. Thus, those girls who knew a pregnant teenager did not respond differently than those who did not, and whether or not a pregnant or mothering teen was known well was not significant

Table 17

Comparison of Mean Attitude Scores (Total Test) for Experience with Pregnancy and Parenthood (GI Items 13, 13c, 14, and 14c)

GI Item	n	M	SD	Range
13. Know pregnant teen:				
yes	292	2.80 a	1.13	1.00-5.92
no	38	2.30 b	0.95	1.00-4.00
13c. Know (13)[1] well:				
yes	184	2.87 a	1.16	1.00-5.92
no	107	2.70 a	1.06	1.00-5.04
14. Know teen mother:				
yes	231	2.90 a	1.12	1.00-5.92
no	99	2.39 b	1.02	1.00-5.02
14c. Know (14)[2] well:				
yes	138	2.85 a	1.15	1.00-5.86
no	92	3.00 a	1.10	1.00-5.92

Note. N = 330 for items 13 and 14; n's for items 13c (291) and 14c (230) represent those who responded affirmatively to items 13 and 14, with the exception of 1 missing response per item.
Possible range of responses = 1-7.
Pairs of means with different letters are significantly different at $p \leq .01$.
[1]Pregnant teen referred to in item 13.
[2]Teen mother referred to in item 14.

Table 18

Comparison of Mean Attitude Scores (Subtests) for Knowledge of an Adolescent Mother (GI 14)

Subtest	GI 14 Response	n	M		SD
Personal Benefits	yes	231	3.50	a	1.35
	no	99	2.91	b	1.35
Physical Aspects	yes	231	3.24	a	1.73
	no	99	2.60	b	1.45
Readiness	yes	231	1.79	a	0.96
	no	99	1.49	b	0.78
Convenience	yes	231	2.45	a	1.32
	no	99	2.00	b	1.00

Note. For each subtest, N = 330. Possible range of scores = 1-7. For each subtest, means with different letters are significantly different at $\rho \leq .01$.

in determining responses on the attitude subtests.

Discussion

The goal of this research question was to examine whether experience with adolescent pregnancy and parenthood via personal knowledge of a pregnant or mothering teen affected attitudes. The vast majority of the students in the sample (88.5%) knew someone who became pregnant as a teenager and over two thirds (70%) knew someone who became a teen mother.

For overall attitudes toward pregnancy and parenting, knowledge of a pregnant teen or teen mother resulted in significantly less negative attitudes, while how well they were known had no effect. Those who reported knowledge of an adolescent mother felt significantly less negatively toward all four subtest issues than those who did not know anyone in this circumstance. Although no statistical significance was obtained for the subtest issues for knowledge of a pregnant teen or knowledge of a pregnant teen well, examination of the results revealed the presence of a trend for attitudes to be less negative when someone in this circumstance was known and also when she was known well. This pattern was not observed for how well a mothering teen was known.

These results indicate that knowledge of a pregnant or mothering teen is associated with less negative attitudes toward pregnancy and parenthood. There are a couple of possible explanations for this observation. First, it could be suggested that girls with less negative attitudes are more likely to know pregnant or parenting peers. However, how well the person was known was not shown to be a significant factor. An alternative explanation is that knowledge (regardless of how well) of

a pregnant or mothering teen might result in a change in attitude from more to less negative. To explain, the awareness that even with all of the attendant complications, most girls who become pregnant or mothers do appear, at least externally, to survive the experience, may result in an attitude shift.

G. Additional Analyses

The vast amount of data collected for this study lends itself to the analysis of relationships among variables which were not the primary focus of the outlined research questions. Because the number of potential additional questions is so large, only some of the more pertinent ones which arose during the course of the study were investigated. Following are descriptions of the relationships between attitudes and birth order, attitudes and religious affiliation, and sexual knowledge and sexual behavior.

Attitudes and Birth Order

Do attitudes toward pregnancy and parenthood differ according to birth position within the family?

As explained in chapter III, at the time of the survey, the birth order status of the subjects was as follows: 10 "only" children (3% of the sample), 93 "youngest" children (28.2%), 147 "oldest" children (44.5%), and 70 "middle" children (21.2%). There were 10 missing responses (3%).

The analysis of the relationship between attitudes and birth order involved the calculations of both a univariate and a multivariate one-way analysis of variance (Total Test by birth order; subtests by birth order). The summary statistics for these are contained, respectively, in Tables I-14 (Appendix I) and J-15 (Appendix J). Neither of the observed F values is significant and thus it can be concluded that the birth position of the subjects did not significantly affect responses on any of the attitude tests.

Attitudes and Religious Affiliation

Do attitudes toward pregnancy and parenthood differ for groups of subjects with different religious affiliations?

As described in chapter III, the religious affiliations indicated by the participants were as follows: Protestant (n=79, 23.9%), Roman Catholic (n=23, 7.3%), Christian (n=24, 7.3%), Mormon (n=4, 1.2%), Jehovah's Witness (n=3, 0.9%), Hinduism (n=1, 0.3%), Muslem (n=1, 0.3%), and none (n=126, 38.2%). There were 69 (20.9%) missing responses.

The relationships between variables were assessed using a univariate and a multivariate one-way analysis of variance (Total Test by religion; subtests by religion). Due to the size of the n's, only those subjects who reported their affiliations to be Protestant, Roman Catholic, Christian, and "none" were included in the analysis. Thus, the ANOVA and MANOVA procedures involved 252 (76%) of the 330 girls in the sample. Tables I-15 (Appendix I) and J-16 (Appendix J) contain the summary statistics for the analyses and show that no significance was obtained in either case. Thus, these four religious affiliations did not significantly differentiate among attitudes on any of the tests.

That there were no significant differences observed might be because the four groups studied did not vary enough with regard to religious affiliation to make a difference in their attitudes regarding pregnancy and parenthood. No data were collected regarding how orthodox their religious practices are, and it is possible that those girls with stronger beliefs might have different attitudes than those with less commitment to their professed religion.

Sexual Knowledge and Sexual Behavior

What is the relationship between sexual knowledge (RPT total score) and sexual behavior (SKQ items 14, 15, 16, and 17)?

Table 19 provides the results of t tests comparing the above variables. The observed significance levels reveal that the hypothesis that mean RPT scores are equal should be rejected only for the first comparison ($\rho \leq .01$). To clarify, subjects who reported having experienced sexual intercourse responded with significantly more correct answers on the RPT. The use of birth control and experience with pregnancy were not found to be related significantly to amount of sexual knowledge. The latter comparison may have been affected by the vastly different numbers of observations in each group.

Table 19

Comparison of Mean Sexual Knowledge Scores for Sexual Behavior (SKQ Items 14, 15, 16, and 17)

SKQ Item	n	M	SD	t	p
14. Had intercourse:					
yes	116	7.08	1.88	4.32	.00
no	214	6.07	2.28		
15. BC (first time):					
yes	58	6.95	1.96	-0.74	.46
no	58	7.21	1.79		
16. BC (recent time):					
yes	67	6.99	1.88	-0.74	.46
no	49	7.16	1.88		
17. Ever pregnant:					
yes	11	7.36	2.33	1.45	.15
no	319	6.39	2.19		

Note. N = 330 for items 14 and 17; n = 116 for items 15 and 16 (those who responded affirmatively to item 14).
BC = birth control.

V. SUMMARY, IMPLICATIONS, SUGGESTIONS, AND CONCLUDING REMARKS

A. Summary and Implications

A vast amount of data was collected and analyzed in this study. The most important findings and their potential implications are summarized as follows.

1. On average, the students demonstrated negative attitudes toward all pregnancy and parenting issues assessed (overall maternal motivation, Personal Benefits, Physical Aspects, Readiness, and Convenience). There was individual variation, however, with responses ranging from 1 to 7 on the 1-7 response continuum. Thus, some girls in the sample felt positively about some of the attitude issues and might be at risk for pregnancy. In addition, it should be noted that few girls who become pregnant do so intentionally, and therefore it is important to continue attempts at identifying related variables in order to effectively implement preventive measures and perhaps identify girls who are at risk for pregnancy.

The clustering of scores toward the negative end of the attitude questionnaire resulted in greater difficulty finding significant differences for the other variables assessed in the study. This should be taken into account during the interpretation of any results.

2. The largest numbers of responses to each of the five open-ended questions scored according to the SOLO Taxonomy were provided at the multistructural level (Level 3), with the numbers tapering off toward both Levels 1 and 5. A Level 3 response is comparable to Piaget's "middle concrete" developmental stage. While some students may not have performed at their maximum potential level on the questions, the

findings are indicative of a very concrete understanding of the aspects of pregnancy and parenthood assessed. In order to increase the likelihood of student learning, education regarding these issues should be presented at a concrete, as opposed to an abstract, level. The possibility exists, and is supported by the literature, that people in this age group may not think abstractly and this has serious implications given the number of sexually active teenagers. To clarify, that the vast majority of the girls in this sample have not revealed the abstract thought processes necessary for the realization of the potential consequences of their actions suggests that sexually active girls might be at risk for pregnancy. There is a need for further research regarding this.

3. The trend was observed that as age increased from 14 to 17 years, attitudes toward all issues of pregnancy and parenting became more negative. This pattern might be accounted for by a change in the following with increasing age: the amount and nature of sex education received, the capacity to meet love and esteem needs in non-sexual ways, and a greater orientation toward the pursuit of future goals.

4. Less than one fifth of the sample believed that "teenagers think they know more about sex than they really do." It appears that for this sample, the often-heard claim that "teenagers think they know it all" is grossly exaggerated. Perhaps inherent in the responses provided is a request for more information on sexual issues.

5. No relationship was revealed between attitudes and amount of sexual knowledge. That knowledge gaps were exhibited, however, especially with regard to the prevention of pregnancy, has serious implications for adolescents who are sexually active and/or might be

passing on misinformation to others. The specific items included in the Sexual Knowledge Questionnaire yield suggestions for the focus of education and as discussed above, the more concrete the education, the more likely learning will occur.

6. About half of the girls in the sample commenced dating by 13 years of age. Literature is discussed in chapter IV which indicates, as would be expected, a relationship between dating and likelihood of sexual activity.

7. About one third of the students claimed to have had sexual intercourse. While half reported using contraceptives for their first experience and slightly more than half by the most recent experience, at least half of the methods reportedly used were unsafe with regard to pregnancy prevention. That the literature reveals a relationship between early sexual activity and high risk of pregnancy, primarily due to lack of contraceptive use (Meikle et al., 1985; Planned Parenthood Federation, 1980), is cause for alarm when one considers the rates of unprotected sexual activity among teens. Additional implications arise when the dramatic increase in sexually transmitted diseases is taken into account.

8. Statistics compiled by Bonham et al. (1987) for Alberta show that the birth rate for the South Peace region, which includes Grande Prairie, was 36 per 1000 females in the 12 to 19 year age range in 1980, and by 1985 was 28 per 1000. This latter rate was higher than rates in 19 other Alberta regions, equal to the rate in 1 region, and lower than those in only 6 regions.

When asked if they had ever been pregnant, 11 (3.3%) of the girls in the study responded affirmatively. As explained by Meikle et al.

(1985), however, these obtained figures are probably artificially low due to a tendency for pregnant teens to either drop out of school or move to other schools.

9. On all five attitude tests, sexually experienced girls, including those who reported having been pregnant, responded with less negative attitudes, and those who used contraceptives had more negative attitudes than those who did not. Possible explanations for these results are that girls who feel more negatively about pregnancy and parenting have chosen not to be sexually active, and perhaps those who are sexually active have thought more about the potential consequences. Even if they may not recognize the possibility of themselves becoming pregnant, cognitive dissonance theory would suggest that their attitudes might be defined to be consistent with their behavior. That girls using birth control felt more negatively than those not using it is not surprising. The stronger desire not to become pregnant likely resulted in the use of preventive measures. As suggested in chapter IV, there is a strong need for more education about and access to more effective contraceptives.

10. On all attitude tests, knowledge of a pregnant or mothering teen was associated with less negative attitudes. Whether the knowledge affected the attitudes is unknown. It is possible that girls who feel less negatively are more likely to know peers with similar attitudes. However, how well the person was known was not found to be related to the attitudes. An alternative explanation is that the awareness that pregnant or mothering teens appear, at least externally, to survive the experience may result in an attitude shift.

11. Neither birth order nor religious affiliation were found to be related to attitudes. Differences in the latter may have resulted had the religious orientations compared been more different from one another and had there been an indication provided of the degree of commitment to the professed religions.

12. While sexually active students provided significantly more correct answers on the measure of sexual knowledge, contraceptive use and pregnancy experience were not related to sexual knowledge. The fact that they are sexually active might result in greater exposure to and interest regarding correct sexual knowledge.

13. The vast majority of girls in the sample (99.1%) expressed the intention to complete high school and most (74.2%) planned to continue their education afterward. As revealed by the frequency distribution in Appendix E and discussed in chapters III and IV, 80% had an idea of what type of career they would like. Although the expressed preferences encompassed a wide spectrum of possibilities, an examination of the specified goals revealed that the majority require training beyond the high school level and a large number require a university education. Future goals might serve a useful purpose in preventive programming in that pregnancy almost always affects high school attendance and thus completion.

14. As revealed in Appendix F, most explanations regarding why teenage girls become pregnant clearly do not include any reference to intention. A great number, in fact, refer to either a lack of knowledge or attempts to fulfill various types of unmet needs. These findings address the concerns of senior Alberta Community Health spokesmen (cited in Tretheway, 1987) that there is a lack of data regarding whether

adolescents are becoming pregnant by choice or because of a lack of birth control information and use. The sexually active girls in this study did not demonstrate pro-pregnancy attitudes. As a whole, the sample demonstrated a lack of information about pregnancy prevention, and most sexually active girls were not adequately protected.

Overall, that adolescent pregnancy and parenthood is an escalating problem cannot be disputed and the recent efflux of research and programming emanates from this recognition. An essential research goal is to attempt to discover why, if attitudes are generally undesirable, and future life goals exist, adolescent girls are becoming pregnant and hindering the likelihood of fulfilling their intended goals. There is a need for more exploratory research such as that presented in this study in order to enable a more clear definition of the factors influencing teenage sexuality in our society, as well as the need for increased public awareness of the nature and extent of the problem, increased focus in the direction of preventive programming, and the provision/continuation of counselling services for adolescents of both sexes and their support systems.

Noteworthy recognition of the importance of the issues surrounding adolescent pregnancy and parenting has been provided by the Minister of Alberta Social Services (C. Osterman), by means of the recent establishment of the Provincial Advisory Committee on the Family. One goal of this committee is to organize a conference to increase awareness of North American research and programs as well as to encourage the coordination of research, funding, educational programming, counselling, medical, legal, Social Services, and public awareness efforts in order to better facilitate all involved (personal communication with R.

McCarthy, Symposium Coordinator, July 27, 1988).

Thus, there is a proliferation of interest in this issue, and while the dissertation research addresses several of the relevant areas, perhaps best explained by S. Maygard, the Executive Director of the Edmonton-based Terra: The Association for Assistance to Unwed Mothers (personal communication, July 27, 1988), it is essential not to lose sight of the holistic nature of adolescents when studying the issues of pregnancy and parenting. Thus, while the nature of research has necessitated what may seem like the fragmentation of this issue for the purpose of this study, such partitioning is a necessary prerequisite for the research process. The limitations of this study, described in chapter III, indicate recognition of the necessity for a specific focus, and the following suggestions for further research indicate awareness of the importance of studying variables that were not included in this research.

B. Suggestions for Further Research

A growing number of psychologists are developing programs based on the prevention rather than the treatment of poor mental health. A task force set up by the American Psychological Association (APA) studied nearly 300 programs implemented across the United States and found plenty of support for their effectiveness in terms of the prevention of poor mental health (Price, 1988). There is a vital need for further research focusing on the prevention of adolescent pregnancies in order that effective programming might be implemented. An excellent overview of a cooperative approach to school-community adolescent pregnancy prevention is provided by Shapiro (1981).

The design of a good research study on adolescent sexuality is complex, partly because of the vast number of issues which need to be addressed. One of the primary tasks for future researchers will be deciding which variables can be meaningfully assessed. The following are recommendations for research which evolved from the process of the current study.

1. It is strongly recommended that any research assessing attitudes take into account the sorts of variables described in the attitude literature as essential to an attitude study and addressed by the research questions designed for this study. While other measurement techniques might prove useful for assessment of the same variables measured in this study, the importance of attempting to account for the relationships between attitudes and cognition, age, knowledge, experience, and behavior, as well as relationships among these variables cannot be underestimated. Specifically which combinations of variables should be addressed and the best methods of data collection remain to be determined. Suggestions are provided below for some of the many issues which merit investigation. To a large extent, the comprehensiveness of any study will be affected by the nature of the topic and the complexity of the study: thesis and dissertation research are more likely to be limited by time, length, and financial constraints, for example, than team research, contract research, or research of a longitudinal nature.

2. A questionnaire for the measurement of paternal motivation should be developed and the attitudes of male adolescents assessed.

3. While 11 of the 330 girls in this study indicated that they had been pregnant, as Meikle et al. (1985) explained, most pregnant girls leave the regular school system. At the time the dissertation research

was conducted there was a program available in Grande Prairie for pregnant/parenting teens and although questionnaires were distributed to the program participants, there were too few for their inclusion in the study as a comparison group. Likewise, questionnaires were completed by pregnant/parenting girls in Edmonton from Terra: The Association for Unwed Mothers, but too few responses were received for inclusion in the research. It is suggested, however, that responses from pregnant/parenting girls and putative fathers be included in future research.

4. It is suggested that the SOLO Taxonomy allows for the meaningful assessment of qualitative information in terms of the cognitive complexity of written responses. However, it is recommended that a large age range of respondents be included in order to increase the likelihood of receiving more responses at the lower and higher levels than were obtained in the current study. A greater diversity of responses should allow for the incorporation of responses at all levels in any statistical procedures. This recommendation is based on the limitation incurred in this study by too few Level 5 responses for their inclusion in all of the analyses (see limitation #2).

5. Valuable information about the relationship between attitudes and behavior would be provided by longitudinal research involving the initial measurement of attitudes toward the use of birth control, pregnancy and parenthood, and sexual behavior, and the subsequent measurement of birth control use, sexual activity, pregnancy, and the interrelatedness of these.

6. Personal interviews with female and male adolescents regarding sexuality/pregnancy/parenting and other related issues would provide

invaluable information. As noted by Kerlinger (1967), perhaps the most important advantage of interview techniques is that they permit "probing into the context of, and reasons for, answers to questions" (p. 468). While there are barriers which must be overcome for the collection of valid and reliable data through interview techniques (Kerlinger), it is suggested by the current researcher that the nature of the topic of adolescent sexuality is likely to impose great challenges with regard to both the participation of a cross-section of respondents as well as the collection of honest responses. If, however, interviews could be designed such that valid and reliable responses could be obtained from a cross-section of adolescents, the results would be most informative.

7. Additional factors worthy of study include the following: knowledge about and attitudes toward sexually transmitted diseases, knowledge about and attitudes toward abortion and adoption, amount and nature of sex education received, alcohol and drug use, tendency toward the adoption of extreme viewpoints, degree and nature of involvement with peers and adolescent culture, locus of control, love and esteem needs, financial needs, self-concept, assertiveness (see Spenrath, 1986, regarding the implementation of an assertion training program with pregnant adolescents), religious affiliation and orthodoxy, tendency toward conformity, family/support system values and behaviors, cultural influence, emotional/behavioral problems (for example, depression, antisocial behvaiors, self-destructive behaviors), history of abuse (physical, sexual, emotional), the dysfunctional family as a significant background factor in adolescent prostitution (Forward & Buck, 1987; Hersch, 1988), and mother-daughter communication regarding sexuality (see Haave, 1986, for an examination of this as it relates to adolescent

pregnancy).

C. Concluding Remarks

The results of the study support the need expressed by several authors for the establishment of preventive programs regarding adolescent pregnancy (Alberta Medical Association, 1980; Haave, 1986; McArnaney & Thiede, 1981; Oettinger, 1979; Phipps-Yonas, 1980; Powell, 1974; Walters, McKenry, & Walters, 1979). To reiterate an assertion included in chapter I, preventive programming needs to be aimed at awareness and values clarification, not just the presentation of factual information and contraceptives. Through the process of this research and experience as a student, teacher, Terra Association board member, and educational consultant, the author's perspective has evolved from the initial suggestion that there is a need for preventive programming for adolescents to the broader suggestion that there is a need for programming for individuals of all ages. Considering that adolescents are not living in isolation but are part of a system of people interacting, it is unreasonable to assume that they should be affected separately from others.

Adolescents of both sexes are physically maturing at an early age in a society which often fails to meet basic love and esteem needs, placing many teens at risk for unhealthy behaviors, including attempts to fulfill unmet needs through opposite-sex relationships. They are exposed from an early age to the advertisement and promotion of sexual activity as fun, fulfilling, enriching, and consequence-free. At the same time, however, they are discouraged from engaging in sexual behaviors until adulthood. Although there is an increase in the

provision of information to the public, such as AIDS education, there remains a desperate need for greater awareness among people of all ages of issues related to sexuality. It is the opinion of this author that for behavior to change, human sexuality must be viewed as a healthy component of a holistic conception of the individual, and the nature of sexuality must be examined wholly, openly, and honestly.

Thus, the recommendation still remains that preventive procedures be developed, but it is suggested that such approaches be aimed at individuals of all ages. The dissertation results have implications for educational programming and for research. With regard to the former, the following should be included as focuses: an increase in knowledge about sexuality, an understanding of human development (physical, emotional, and cognitive), awareness of the possibility of sexual behavior as a means of seeking needs-satisfaction, indicators of at-risk teens, knowledge of the potential consequences of sexual behavior (including pregnancy and the resultant choices regarding parenting/abortion/adoption; sexually transmitted diseases; and other physical, social, and emotional repercussions) and finally, the need for the concrete presentation of information. With respect to further research, chapter V includes suggestions for many variables worthy of study.

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APPENDIX A

COVER PAGE AND GENERAL INFORMATION QUESTIONS

Thank you for participating in a University of Alberta study. We are interested in finding out what teen girls think about teenage pregnancy. About 450 girls in grades 9-11 in Grande Prairie will be filling out these questionnaires. Please read the following before you begin.

1. Check to make sure you have pages 1-18.

2. To keep your answers confidential and private, DO NOT PUT YOUR NAME anywhere on these questionnaires. Do not worry about having someone recognize your handwriting - none of your teachers or principals will see your answers. The papers will be put in a box as soon as you are finished and the boxes will be taken to the university in Edmonton.

3. Because this study is important, your answers are also important. Please answer each question honestly and carefully. If any questions are left blank, the whole questionnaire cannot be used in the study - DO NOT SKIP ANY QUESTIONS.

4. Work through the questionnaires in the order that they are given - begin at page 2 and work through to page 18. If you need more space for any of your answers, turn the page over and continue writing on the back.

GENERAL INFORMATION

1. a. age ____
   b. birth date: day _____ month _____ year _____

2. What language do you usually speak/write?
   English ____ French ____ Other (explain) _____

3. a. How many brothers and sisters do you have? ____
   b. How old are they? _____

4. What grade are you presently in? ____

5. Do you plan to finish high school?
   yes ____ no ____

6. When you finish high school:
   a. Do you plan to continue your education?
      yes ____ no ____ not sure ____
   b. What work would you most like? _____

7. Do you ever babysit? yes ____ no ____
   If your answer is yes:
   a. How often: hardly ever ____
      sometimes ____
      often ____
   b. How old are the children? ____
   c. Do you like it? yes ____ no ____
      Please explain why or why not.

8. Have you ever taken a babysitting course?
   yes ____ no ____

9. a. Do you want to get married some day?
      yes ____ no ____ not sure ____
   b. What age would you like to be when you get married?
      ____

10. a. Would you like to be a mother some day?
yes ____ no ____ not sure ____
b. If yes, how old would you like to be when you have your first child? ____

11. Please describe below what you think it would be like to be a mother.

12. Do you think it would be the same to be a mother while you are under the age of 18 and unmarried as it would be if you were 18 or older and married? yes ____ no ____
Please explain your answer.

13. Do you know anyone who became pregnant while she was still a teenager? yes ____ no ____
If your answer is yes:
a. How old was she when she became pregnant? ____
b. Was she married at the time? yes ____ no ____
c. Did you know this person well? yes ____ no ____
d. Did it turn out to be a good or a bad experience for her? good ____ bad ____
Please explain your answer to d.

14. Do you know anyone who became a teenage mother?
yes ____ no ____
If your answer is yes:
a. How old was she when she had her baby? ____
b. Was she married:
1) when she became pregnant? yes ____ no ____
2) when she had her baby? yes ____ no ____
c. Did you know this person well?
yes ____ no ____
d. Did it turn out to be a good or a bad experience for her? good ____ bad ____
Please explain your answer to d.

15. In your opinion, why do teenage girls get pregnant?

APPENDIX B

OPEN-ENDED QUESTIONS FOR SOLO SCORING

SOLO QUESTIONS

Many girls between the ages of 12 and 19 are getting pregnant these days. In Canada, about 1 in every 25 teenage girls gets pregnant each year. In the United States, this number is 1 in every 10 girls.

We are trying to gather some information from teen girls themselves about how they think pregnancy would affect a teen girl's life. Please CAREFULLY read and answer the following five questions. The first question is quite general and the other four are aimed at more specific aspects of pregnancy. Some of the questions may seem to be similar but they are a bit different from one another - the underlined words tell you what the most important aspect of each question is. Please answer each question carefully, even if your answer overlaps with the answer to another question.

1. How would pregnancy affect a teenage girl's life (how would a teen's life be affected if she became pregnant)? Please describe and discuss the possible consequences.

2. Some girls say that there are personal benefits to becoming pregnant as a teenager. Describe and discuss any personal benefits for teens that you can think of.

3. Many teenagers feel that they are not yet <u>ready</u> to become pregnant - that it is not yet the right time in their lives. Explain what kinds of things would affect whether or not teen girls would feel ready for pregnancy.

4. Some teen girls find the idea of pregnancy emotionally attractive. That is, there are things about it that are appealing (that they think would be nice). Explain anything about getting pregnant that you think might be emotionally attractive to teen girls.

5. One of the aspects of teenage pregnancy is convenience. That is, some girls would say that getting pregnant does not "fit into" their lives while they are teenagers. What do you think would make pregnancy convenient or inconvenient for teens? Explain your answer.

APPENDIX C

MODIFIED MATERNAL ATTITUDE QUESTIONNAIRE (MAQ)

ATTITUDE QUESTIONNAIRE

Following are statements which describe things about pregnancy and having children that some people will find desirable (will like) and others will find undesirable (will not like). There are no right or wrong answers. Please read each item and decide whether you feel it would be desirable or undesirable RIGHT NOW IN YOUR LIFE. The rating scale for each item is as follows:

Circle 1 if you feel it is highly undesirable
Circle 2 if you feel it is moderately undesirable
Circle 3 if you feel it is slightly undesirable
Circle 4 if you feel neutral about it
Circle 5 if you feel it is slightly desirable
Circle 6 if you feel it is moderately desirable
Circle 7 if you feel it is highly desirable

Please read each item carefully. The best answer is the number which most closely matches the way you feel about these happening right now in your life.

1. Taking complete care of a little baby.

   undesirable 1 2 3 4 5 6 7 desirable

2. Having a baby to help me cope with boredom.

   undesirable 1 2 3 4 5 6 7 desirable

3. Devoting myself and much of my time to raising a baby.

   undesirable 1 2 3 4 5 6 7 desirable

4. Giving up my freedom to do other things.

   undesirable 1 2 3 4 5 6 7 desirable

5. Quitting school to take care of a baby.

   undesirable 1 2 3 4 5 6 7 desirable

6. Having a child who is a satisfaction to my parents.

   undesirable 1 2 3 4 5 6 7 desirable

7. Giving up space in the house.

undesirable 1 2 3 4 5 6 7 desirable

8. Having people admire my baby.

undesirable 1 2 3 4 5 6 7 desirable

9. Having a child who fulfills my relationship with my boyfriend.

undesirable 1 2 3 4 5 6 7 desirable

10. Having a child who represents God's will.

undesirable 1 2 3 4 5 6 7 desirable

11. Giving birth to a baby.

undesirable 1 2 3 4 5 6 7 desirable

12. Getting pregnant before I am married.

undesirable 1 2 3 4 5 6 7 desirable

13. Having a child when my parents don't want me to.

undesirable 1 2 3 4 5 6 7 desirable

14. Knowing that I am fertile (can get pregnant).

undesirable 1 2 3 4 5 6 7 desirable

15. Taking care of a child when I feel like doing other things.

undesirable 1 2 3 4 5 6 7 desirable

16. Having a child who helps me to feel closer to any of my friends who have babies.

undesirable 1 2 3 4 5 6 7 desirable

17. Reliving my own childhood through a baby.

undesirable 1 2 3 4 5 6 7 desirable

18. Having a child who will support me in my old age.

undesirable 1 2 3 4 5 6 7 desirable

19. Taking care of a baby in addition to doing my schoolwork.

undesirable 1 2 3 4 5 6 7 desirable

20. Having a child my parents will take care of.

undesirable 1 2 3 4 5 6 7 desirable

21. Having a child who is unplanned.

undesirable 1 2 3 4 5 6 7 desirable

22. Having a child when I am very young.

undesirable 1 2 3 4 5 6 7 desirable

23. Having a child who makes me feel like a woman.

undesirable 1 2 3 4 5 6 7 desirable

24. Feeling a baby kick and move inside me.

undesirable 1 2 3 4 5 6 7 desirable

25. Having a son.

undesirable 1 2 3 4 5 6 7 desirable

26. Feeling closer to nature through a baby.

undesirable 1 2 3 4 5 6 7 desirable

27. Having a baby who makes me feel closer to my mother.

undesirable 1 2 3 4 5 6 7 desirable

28. Giving up my freedom to be with my friends.

undesirable 1 2 3 4 5 6 7 desirable

29. Getting pregnant while I am still in school.

undesirable 1 2 3 4 5 6 7 desirable

30. Finishing school while I am pregnant.

undesirable 1 2 3 4 5 6 7 desirable

31. Thinking about the issue of abortion.

undesirable 1 2 3 4 5 6 7 desirable

32. Spending money on a child.

undesirable 1 2 3 4 5 6 7 desirable

33. Having a child to help me cope with loneliness.

undesirable 1 2 3 4 5 6 7 desirable

34. Breastfeeding or just cuddling a little baby.

undesirable 1 2 3 4 5 6 7 desirable

35. Experiencing the process of childbirth.

undesirable 1 2 3 4 5 6 7 desirable

36. Having my own flesh and blood live on after me.

undesirable 1 2 3 4 5 6 7 desirable

37. Having a child change my life goals.

undesirable 1 2 3 4 5 6 7 desirable

38. Having a baby my boyfriend does not especially want.

undesirable 1 2 3 4 5 6 7 desirable

39. Experiencing all of the changes of pregnancy.

undesirable 1 2 3 4 5 6 7 desirable

40. Having a daughter.

undesirable 1 2 3 4 5 6 7 desirable

41. Thinking about the possibility of having a deformed child.

undesirable 1 2 3 4 5 6 7 desirable

42. Having a child I will raise by myself.

undesirable 1 2 3 4 5 6 7 desirable

43. Getting pregnant now.

undesirable 1 2 3 4 5 6 7 desirable

44. Being a mother.

undesirable 1 2 3 4 5 6 7 desirable

45. Feeling less selfish through a baby.

undesirable 1 2 3 4 5 6 7 desirable

46. Having a baby to love.

undesirable 1 2 3 4 5 6 7 desirable

47. Experiencing the discomforts of pregnancy.

undesirable 1 2 3 4 5 6 7 desirable

48. Having a child who gives me a sense of feeling needed.

undesirable 1 2 3 4 5 6 7 desirable

49. Thinking about the possibility of having a mentally retarded child.

undesirable 1 2 3 4 5 6 7 desirable

50. Having a child who is born when I am not married.

undesirable 1 2 3 4 5 6 7 desirable

51. Having a child wanted mostly by my boyfriend.

undesirable 1 2 3 4 5 6 7 desirable

52. Being able to make up for some of my mistakes by having a baby.

undesirable 1 2 3 4 5 6 7 desirable

53. Spending most of my spare time taking care of a baby.

undesirable 1 2 3 4 5 6 7 desirable

54. Having a helpless baby to love and protect.

undesirable 1 2 3 4 5 6 7 desirable

APPENDIX D

MEASURE OF SEXUAL KNOWLEDGE AND SEXUAL BEHAVIOR

SEXUAL KNOWLEDGE QUESTIONNAIRE

Please answer each of the following questions as best you can by placing a check mark in the appropriate space or by writing in the answer. Your answers are strictly confidential and anonymous.

1. At what age did you begin dating boys?

   before the age of 11 ____
   between 11-13 ____
   between 14-16 ____
   between 17-19 ____
   not yet ____

2. Teenagers think they know more about sex than they really do.

   yes ____
   no ____
   don't know ____

3. The younger a girl is, the easier it is for her to get pregnant.

   yes ____
   no ____
   don't know ____

4. Is a girl physically capable of becoming pregnant before her first menstrual (monthly) period?

   yes ____
   no ____
   don't know ____

5. A girl can become pregnant during her menstrual (monthly) period.

   yes ____
   no ____
   don't know ____

6. A girl is most likely to get pregnant the day after her menstrual (monthly) period.

   yes ____
   no ____
   don't know ____

7. Sperm can live in the girl's reproduction system for about 72 hours (three days).

   yes ____
   no ____
   don't know ____

8. A girl can become pregnant without full intercourse taking place (going all the way).

yes ____
no ____
don't know ____

9. Does a woman have to have an orgasm (climax) during intercourse before she can get pregnant?

yes ____
no ____
don't know ____

10. Is there any age when a boy is old enough to have intercourse (go all the way) and not risk making a girl pregnant?

yes ____
no ____
don't know ____

11. Are there periods in the month when a boy is not fertile (not able to make a girl pregnant)?

yes ____
no ____
don't know ____

12. Does a boy have a daily limit of sperm which can be exhausted with the result that he cannot get a girl pregnant thereafter?

yes ____
no ____
don't know ____

13. In general, the younger the girl the more damaging a pregnancy is to her physical health.

yes ____
no ____
don't know ____

14. Have you ever had full sexual intercourse?

yes ____
no ____

If your answer to question 14 was no, place a check mark beside "not applicable" for questions 15 and 16.

15. Did you use birth control for your first experience with intercourse?

yes ____
no ____
not applicable ____

If your answer was yes, what kind of birth control did you use? _____

16. Did you use birth control for your most recent experience with intercourse?

yes ____
no ____
not applicable ____

If your answer was yes, what kind of birth control did you use? _____

17. Have you ever been pregnant?

yes ____
no ____

You made it to the end! Please go back and check each page to make sure you did not miss any questions. Thank you for filling out the questionnaires - your time and effort are greatly appreciated.

APPENDIX E

FREQUENCY DISTRIBUTION OF DESIRED OCCUPATIONS

(GENERAL INFORMATION QUESTION 6B)

Table E-1

Frequency Distribution of Desired Occupations

Occupational group	n	%
Managerial/administrative/related	10	3.0
Natural Sciences/engineering/mathematics	20	6.1
Social sciences/related	45	13.6
Teaching/related	28	8.5
Medicine/health	60	18.2
Artistic/literary/recreational/related	49	14.8
Clerical/related	10	3.0
Sales	9	2.7
Service	25	7.6
Farming/horticultural/animal husbandry	1	0.3
Forestry/logging	1	0.3
Product fabricating/assembling/repairing	4	1.2
Transport equipment operating	1	0.3
Other crafts/equipment operating	1	0.3
Unclassifiable responses	24	7.3
Missing data: "don't know"/no response	42	12.7

Note. N=330.

APPENDIX F

FREQUENCY DISTRIBUTION OF OPINIONS REGARDING WHY TEENAGE GIRLS GET PREGNANT (GENERAL INFORMATION QUESTION 15)

Table F-1

Frequency Distribution: Why Teenage Girls Get Pregnant

Response	n	%
1. Re birth control		
-lack of information	22	7
-scared/embarrassed to ask (parents/boyfriend/doctor)	10	3
-none or ineffective	78	24
-no access/couldn't afford	3	1
-a bother	7	2
-not important	1	0.3
subtotals	(121)	(37)
2. Accident	87	26
3. Intentional/planned it		
-general response	17	5
-treated/feel like adult	5	2
-fulfill life	2	1
-want child	9	3
-want motherhood	2	1
-escape from home	3	1
-have child when young	1	0.3
-experience pregnancy	1	0.3
-sense of acceptance	1	0.3
subtotals	(41)	(12)
4. Re love/affection		
-love guy/each other	23	7
-need to be loved/needed/wanted	19	6
-need to be loved/needed/wanted by boyfriend	2	1
-need to give love	4	1
-someone to want/love/need them	11	3
-someone of own to love/care for	11	3
-lonely	2	1
-means you love the guy	1	0.3
subtotals	(73)	(22)
5. Think it won't happen to them	36	11
6. Carelessness	65	20
7. Boyfriend (trap/keep/marry/have someplace to stay)	20	6

Table F-1 (continued)

Response	n	%
8. Don't care what happens		
-general response	6	2
-upset at time/not thinking	1	0.3
-easy to have baby/get abortion	2	1
subtotals	(9)	(3)
9. Problems		
-general response	2	1
-at home (abuse/no love/unstable/ to get away)	15	5
subtotals	(17)	(5)
10. Forced/rape/fear	8	2
11. Alcohol/drugs involved	4	1
12. Had sex	5	2
13. Like sex/sex fun	17	5
14. Didn't realize consequences of actions		
-general response	20	6
-how easy to get pregnant	2	1
-responsibility involved	4	1
subtotals	(26)	(8)
15. Rebel/anger/revenge		
-unspecified target	8	2
-directed at parents	13	4
-directed at boyfriend	1	0.3
subtotals	(22)	(7)
16. Lack of information re sex/pregnancy		
-general response	14	4
-don't know what they are getting into	5	2
-lack of talk re subject at home	6	2
subtotals	(25)	(8)
17. Pressure		
-unspecified source	11	3
-from boyfriend	39	12
-from peers	27	8
subtotals	(77)	(23)

Table F-1 (continued)

Response	n	%
18. Caught in the heat of the moment (not saying 'no'/not getting bc)	17	5
19. Get attention	16	5
20. Insecure	10	3
21. Unexpected sexual encounter	8	2
22. Curiosity/experimentation with sex	8	2
23. Stupidity/dumb	6	2
24. Unaware of how to handle situation (when to stop/afraid to say no)	5	2
25. Immature	4	1
26. Getting married soon	1	0.3
27. Impatience	1	0.3
28. Feels right	1	0.3
29. Lack of definite opinion re premarital sex	1	0.3
30. Not their fault	1	0.3
31. Make life easier	1	0.3
32. Sleazy	1	0.3
33. Don't know	1	0.3
34. No response	1	0.3

Note. N=330. The responses were categorized according to the exact words used by the respondents - further condensation of the categories may have resulted in the imposition of meaning that was not intended by the students, or the exclusion of meaning that was intended. Because many students provided more than one answer and the responses are therefore represented in more than one category, the total number of responses does not correspond with the N of 330.

APPENDIX G

FACTORS UNDERLYING THE MODIFIED MATERNAL ATTITUDE QUESTIONNAIRE

Table G-1

Questions Loading on Factor 1: Personal Benefits

Question	Loading	h^2
2. Having a baby to help me cope with boredom.	.492	.306
6. Having a child who is a satisfaction to my parents.	.674	.446
8. Having people admire my baby.	.669	.612
9. Having a child who fulfills my relationship with my boyfriend.	.755	.479
10. Having a child who represents God's will.	.654	.387
14. Knowing that I am fertile (can get pregnant).	.284	.271
16. Having a child who helps me to feel closer to any of my friends who have babies.	.640	.523
17. Reliving my own childhood through a baby.	.680	.408
18. Having a child who will support me in my old age.	.753	.389
20. Having a child my parents will take care of.	.541	.284
23. Having a child who makes me feel like a woman.	.521	.482
25. Having a son.	.343	.554
26. Feeling closer to nature through a baby.	.500	.604
27. Having a baby who makes me feel closer to my mother.	.650	.532
33. Having a child to help me cope with loneliness.	.740	.546
36. Having my own flesh and blood live on after me.	.532	.671
40. Having a daughter.	.547	.576
45. Feeling less selfish through a baby.	.560	.512
46. Having a baby to love.	.525	.684

Table G-1 (continued)

Question	Loading	h^2
48. Having a child who gives me a sense of feeling needed.	.517	.615
51. Having a child wanted mostly by my boyfriend.	.301	.240
52. Being able to make up for some of my mistakes by having a baby.	.385	.316
54. Having a helpless baby to love and protect.	.498	.672

Note. Source: principal axis method of factor analysis with an oblique promax rotation.
% of the common variance: 35.682
% of the total variance: 35.200

Table G-2

Questions Loading on Factor 2: Physical Aspects

Question	Loading	h^2
11. Giving birth to a baby.	.590	.525
24. Feeling a baby kick and move inside me.	.741	.625
34. Breastfeeding or just cuddling a little baby.	.674	.671
35. Experiencing the process of childbirth.	.892	.663
39. Experiencing all of the changes of pregnancy.	.705	.609
44. Being a mother.	.555	.488
47. Experiencing the discomforts of pregnancy.	.734	.564

Note. Source: principal axis method of factor analysis with an oblique promax rotation.
% of the common variance: 26.489
% of the total variance: 26.131

Table G-3

Questions Loading on Factor 3: Readiness

Question	Loading	h^2
12. Getting pregnant before I am married.	.817	.592
13. Having a child when my parents don't want me to.	.539	.356
21. Having a child who is unplanned.	.695	.577
22. Having a child when I am very young.	.598	.509
29. Getting pregnant while I am still in school.	.647	.478
30. Finishing school while I am pregnant.	.564	.370
37. Having a child change my life goals.	.215	.346
38. Having a baby my boyfriend does not especially want.	.595	.424
42. Having a child I will raise by myself.	.265	.339
43. Getting pregnant now.	.613	.495
50. Having a child who is born when I am not married.	.750	.548

Note. Source: principal axis method of factor analysis with an oblique promax rotation.
% of the common variance: 20.633
% of the total variance: 20.354

Table G-4

Questions Loading on Factor 4: Convenience

Question	Loading	h^2
1. Taking complete care of a little baby.	.568	.511
3. Devoting myself and much of my time to raising a baby.	.778	.749
4. Giving up my freedom to do other things.	.673	.522
5. Quitting school to take care of a baby.	.464	.477
7. Giving up space in the house.	.444	.480
15. Taking care of a child when I feel like doing other things.	.654	.495
19. Taking care of a baby in addition to doing my schoolwork.	.443	.461
32. Spending money on a child.	.294	.431
53. Spending most of my spare time taking care of a baby.	.573	.638

Note. Source: principal axis method of factor analysis with an oblique promax rotation.
% of the common variance: 17.202
% of the total variance: 16.970

APPENDIX H

EXAMPLE OF SOLO SCORING PROCEDURE

EXAMPLES OF RELEVANT POINTS AND LEVELS SCORED FOR SOLO QUESTION 3

3. Many teenagers feel that they are not yet ready to become pregnant - that it is not yet the right time in their lives. Explain what kinds of things would affect whether or not teen girls would feel ready for pregnancy.

NOTE: the relevant points are underlined.

LEVEL 1: PRESTRUCTURAL

Some teens feels that the only time you should make love is when your in love with your boyfriend and you and him have discussed it. Others feel that making love is no big deal "Oh Im just out for a good time" or "it feels good" It may feel good but look what it could lead to PREGNANCY!!

LEVEL 2: UNISTRUCTURAL

During teenage life you are soppose to go and party get all those fun years before there all gone you will have time for pregnancy when your married or adoption.

LEVEL 3: MULTISTRUCTURAL

money, education, personal feelings, health, acceptance, maturity, family, friends, beliefs/religion, ability (handicap)

LEVEL 4: RELATIONAL

They are not ready yet because they might want to explore life. They might want to travel, finish school, just enjoy life.

(relating point: exploration of life)

LEVEL 5: EXTENDED ABSTRACT

Have goals to reach for in their lives: finish school, start a career. They have to much to live for, wreck their lives. Not saying they wouldn't love the baby if they did get pregnant but after it was born the girl might feel a lot of resentment towards the child. Which can lead to abuse, neglect & hurt the child even if she didn't mean to!
(outside information: the last sentence)

APPENDIX I

UNIVARIATE ANALYSIS OF VARIANCE TABLES

Table I-1

Analysis of Variance Summary Table for Attitudes (Total Test) by SOLO Question 1 (Re Effect of Pregnancy on a Teenage Girl's Life)

Source of Variation	df	SS	MS	F	p
Between groups	2	0.44	0.22	0.17	.84
Within groups	320	401.27	1.25		
Total	322	401.71			

Note. Number of groups = 3: Levels 2, 3, and 4 responses. Levels 1 and 5 responses were excluded due to small n's (1 and 6).

Table I-2

Analysis of Variance Summary Table for Attitudes (Personal Benefits Subtest) by SOLO Question 2 (Re Personal Benefits)

Source of Variation	df	SS	MS	F	p
Between groups	3	12.92	4.31	2.32	.08
Within groups	325	603.24	1.86		
Total	328	616.16			

Note. Number of groups = 4: Levels 1, 2, 3, and 4 responses. Level 5 responses were excluded due to a small n (1).

Table I-3

Analysis of Variance Summary Table for Attitudes (Readiness Subtest) by SOLO Question 3 (Re Readiness)

Source of Variation	df	SS	MS	F	p
Between groups	3	10.26	3.42	4.19	.01
Within groups	325	265.51	0.82		
Total	328	275.77			

Note. Number of groups = 4: Levels 1, 2, 3, and 4 responses. Level 5 responses were excluded due to a small n (1).

Table I-4

Analysis of Variance Summary Table for Attitudes (Convenience Subtest) by SOLO Question 5 (Re Convenience)

Source of Variation	df	SS	MS	F	p
Between groups	3	22.12	7.38	4.97	.00
Within groups	323	479.41	1.48		
Total	326	501.52			

Note. Number of groups = 4: Levels 1, 2, 3, and 4 responses. Level 5 responses were excluded due to a small n (3).

Table I-5

Analysis of Variance Summary Table for Attitudes (Total Test) by Age

Source of Variation	df	SS	MS	F	p
Between groups	3	11.56	3.85	3.15	.03
Within groups	326	398.54	1.22		
Total	329	410.10			

Note. Number of groups = 4: < 16 years, 16 years, 17 years, > 17 years.

Table I-6

Analysis of Variance Summary Table for Attitudes (Total Test) by Sexual Intercourse (SKQ 14)

Source of Variation	df	SS	MS	F	p
Between groups	1	23.17	23.17	19.64	.00
Within groups	328	386.93	1.18		
Total	329	410.10			

Note. Number of groups = 2: yes/no responses.

Table I-7

Analysis of Variance Summary Table for Attitudes (Total Test) by Use of Birth Control for First Sexual Experience (SKQ 15)

Source of Variation	df	SS	MS	F	p
Between groups	1	10.26	10.26	9.11	.00
Within groups	115	129.49	1.13		
Total	116	139.76			

Note. Number of groups = 2: yes/no responses.

Table I-8

Analysis of Variance Summary Table for Attitudes (Total Test) by Use of Birth Control for Most Recent Sexual Experience (SKQ 16)

Source of Variation	df	SS	MS	F	p
Between groups	1	3.65	3.65	3.06	.08
Within groups	114	135.86	1.19		
Total	115	139.50			

Note. Number of groups = 2: yes/no responses.

Table I-9

Analysis of Variance Summary Table for Attitudes (Total Test) by Pregnancy (SKQ 17)

Source of Variation	df	SS	MS	F	ρ
Between groups	1	14.24	14.24	11.80	.00
Within groups	328	395.86	1.21		
Total	329	410.10			

Note. Number of groups = 2: yes/no responses.

Table I-10

Analysis of Variance Summary Table for Attitudes (Total Test) by Knowledge of a Pregnant Adolescent (GI 13)

Source of Variation	df	SS	MS	F	p
Between groups	1	8.52	8.52	6.96	.01
Within groups	328	401.58	1.22		
Total	329	410.10			

Note. Number of groups = 2: yes/no responses.

Table I-11

Analysis of Variance Summary Table for Attitudes (Total Test) by Knowledge of a Pregnant Adolescent Well (GI 13c)

Source of Variation	df	SS	MS	F	ρ
Between groups	1	2.10	2.10	1.66	.20
Within groups	289	366.06	1.27		
Total	290	368.16			

Note. Number of groups = 2: yes/no responses.

Table I-12

Analysis of Variance Summary Table for Attitudes (Total Test) by Knowledge of an Adolescent Mother (GI 14)

Source of Variation	df	SS	MS	F	p
Between groups	1	17.83	17.83	14.91	.00
Within groups	328	392.27	1.20		
Total	329	410.10			

Note. Number of groups = 2: yes/no responses.

Table I-13

Analysis of Variance Summary Table for Attitudes (Total Test) by Knowledge of an Adolescent Mother Well (GI 14c)

Source of Variation	df	SS	MS	F	ρ
Between groups	1	1.25	1.25	0.98	.32
Within groups	228	289.55	1.27		
Total	229	290.80			

Note. Number of groups = 2: yes/no responses.

Table I-14

Analysis of Variance Summary Table for Attitudes (Total Test) by Birth Order

Source of Variation	df	SS	MS	F	ρ
Between groups	3	1.27	0.42	0.34	.80
Within groups	316	397.32	1.26		
Total	319	398.59			

Note. Number of groups = 4: "only", "youngest", "oldest", and "middle" birth positions.

Table I-15

Analysis of Variance Summary Table for Attitudes (Total Test) by Religious Affiliation

Source of Variation	df	SS	MS	F	p
Between groups	3	2.40	0.80	0.72	.54
Within groups	248	273.93	1.10		
Total	251	276.33			

Note. Number of groups = 4: Protestant, Roman Catholic, "Christian", and no religious affiliation.

APPENDIX J

MULTIVARIATE ANALYSIS OF VARIANCE TABLES

Table J-1

Analysis of Variance Summary Table for Attitudes (Subtests) by SOLO Question 1 (Re Effect of Pregnancy on a Teenage Girl's Life)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.02	0.80	8	636	.61

F Tests[2] (2, 320)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	0.20	604.48	0.10	1.89	0.05	.95
Subtest 2	2.12	902.12	1.06	2.82	0.38	.69
Subtest 3	2.38	271.74	1.19	0.85	1.40	.25
Subtest 4	2.43	504.07	1.21	1.58	0.77	.46

Note. Subscripts: h = hypothesis; e = error.
SOLO question responses at Levels 1 and 5 were excluded due to small n's (1 and 6, respectively).
[1]s = 2, m = .5, n = 157.5.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-2

Analysis of Variance Summary Table for Attitudes (Subtests) by SOLO Question 2 (Re Personal Benefits)

Test of Significance[1]					
Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.54	1.47	12	972	.13

F Tests[2] (3, 325)						
Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	19.92	603.24	4.31	1.86	2.32	.08
Subtest 2	19.44	898.50	6.48	2.76	2.34	.07
Subtest 3	1.61	273.78	0.54	0.84	0.64	.59
Subtest 4	6.12	505.50	2.04	1.56	1.31	.27

Note. Subscripts: h = hypothesis; e = error.
SOLO question responses at Level 5 were excluded due to a small n (1).
[1]s = 3, m = 0, n = 160.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-3

Analysis of Variance Summary Table for Attitudes (Subtests) by SOLO Question 3 (Re Readiness)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.52	1.42	12	972	.15

F Tests[2] (3, 325)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	9.51	610.70	3.17	1.88	1.69	.17
Subtest 2	4.74	916.18	1.58	2.82	0.56	.64
Subtest 3	10.26	265.51	3.42	0.82	4.19	.01
Subtest 4	9.92	502.86	3.31	1.55	2.14	.10

Note. Subscripts: h = hypothesis; e = error.
SOLO question responses at Level 5 were excluded due to a small n (1).
[1]s = 3, m = 0, n = 160.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-4

Analysis of Variance Summary Table for Attitudes (Subtests) by SOLO Question 4 (Re Emotional Attractiveness)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.06	1.73	12	972	.055

F Tests[2] (3, 325)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	12.71	605.15	4.24	1.86	2.28	.08
Subtest 2	15.92	904.04	5.31	2.78	1.91	.13
Subtest 3	0.87	274.52	0.29	0.84	0.34	.80
Subtest 4	1.96	509.38	0.65	1.57	0.42	.74

Note. Subscripts: h = hypothesis; e = error.
SOLO question responses at Level 5 were excluded due to a small n (1).
[1]s = 3, m = 0, n = 160.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-5

Analysis of Variance Summary Table for Attitudes (Subtests) by SOLO Question 5 (Re Convenience)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.12	3.32	12	966	.00

F Tests[2] (3, 323)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	13.73	600.28	4.58	1.86	2.46	.06
Subtest 2	0.58	914.24	0.19	2.83	0.07	.97
Subtest 3	5.97	268.90	1.99	0.83	2.39	.07
Subtest 4	22.12	479.41	7.37	1.48	4.97	.00

Note. Subscripts: h = hypothesis; e = error.
SOLO question responses at Level 5 were excluded due to a small n (3).
[1]s = 3, m = 0, n = 159.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-6

Analysis of Variance Summary Table for Attitudes (Subtests) by Age

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.06	1.73	12	975	.056

F Tests[2] (3, 326)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	21.56	598.68	7.19	1.84	3.91	.01
Subtest 2	17.48	903.58	5.83	2.77	2.10	.10
Subtest 3	2.95	272.93	0.98	0.84	1.17	.32
Subtest 4	7.93	505.14	2.64	1.55	1.71	.17

Note. Subscripts: h = hypothesis; e = error.
[1]s = 3, m = 0, n = 160.5.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-7

Analysis of Variance Summary Table for Attitudes (Subtests) by Sexual Intercourse (SKQ 14)

Test of Significance[1]

Test	Value	≈F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.06	5.00	4	325	.00

F Tests[2] (1, 328)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	28.79	591.45	28.79	1.80	15.97	.00
Subtest 2	32.97	888.09	32.97	2.71	12.18	.00
Subtest 3	9.41	266.47	9.41	0.81	11.59	.00
Subtest 4	23.02	490.05	23.02	1.49	15.40	.00

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 161.5.
[2]The F tests generated by SPSS^X are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-8

Analysis of Variance Summary Table for Attitudes (Subtests) by Use of Birth Control for First Sexual Experience (SKQ 15)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.08	2.46	4	112	.05

F Tests[2] (1, 115)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	9.85	176.60	9.85	1.54	6.42	.01
Subtest 2	16.07	328.53	16.07	2.86	5.62	.02
Subtest 3	8.83	123.63	8.83	1.08	8.21	.01
Subtest 4	9.27	201.20	9.27	1.75	5.30	.02

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 55.
[2]The F tests generated by SPSS^{x} are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-9

Analysis of Variance Summary Table for Attitudes (Subtests) by Use of Birth Control for Most Recent Sexual Experience (SKQ 16)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.08	2.32	4	111	.06

F Tests[2] (1, 114)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	0.55	185.79	0.55	1.63	0.34	.56
Subtest 2	9.75	332.99	9.75	2.92	3.34	.07
Subtest 3	5.75	126.46	5.75	1.11	5.18	.03
Subtest 4	11.04	199.37	11.04	1.75	6.31	.01

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 54.5.
[2]The F tests generated by SPSS^X are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-10

Analysis of Variance Summary Table for Attitudes (Subtests) by Pregnancy (SKQ 17)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.04	3.37	4	325	.01

F Tests[2] (1, 328)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	16.53	603.70	16.53	1.84	8.98	.00
Subtest 2	15.99	905.07	15.99	2.76	5.79	.02
Subtest 3	8.00	267.88	8.00	0.82	9.79	.00
Subtest 4	16.15	496.92	16.15	1.51	10.66	.00

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 161.5.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-11

Analysis of Variance Summary Table for Attitudes (Subtests) by Knowledge of a Pregnant Adolescent (GI 13)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.02	1.73	4	325	.14

F Tests[2] (1, 328)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	10.88	609.35	10.88	1.86	5.86	.02
Subtest 2	13.82	907.24	13.82	2.77	5.00	.03
Subtest 3	3.20	272.68	3.20	0.83	3.85	.05
Subtest 4	7.33	505.74	7.33	1.54	4.75	.03

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 161.5.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-12

Analysis of Variance Summary Table for Attitudes (Subtests) by Knowledge of a Pregnant Adolescent Well (GI 13c)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.02	1.53	4	286	.19

F Tests[2] (1, 289)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	0.87	540.97	0.87	1.87	0.47	.50
Subtest 2	0.98	344.55	0.98	2.92	0.34	.56
Subtest 3	4.28	254.31	4.28	0.88	4.87	.03
Subtest 4	5.75	473.80	5.75	1.64	3.51	.06

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 142.
[2]The F tests generated by SPSS[x] are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-13

Analysis of Variance Summary Table for Attitudes (Subtests) by Knowledge of an Adolescent Mother (GI 14)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.04	3.70	4	325	.01

F Tests[2] (1, 328)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	24.12	596.11	24.12	1.82	13.27	.00
Subtest 2	28.96	892.10	28.96	2.72	10.65	.00
Subtest 3	6.07	269.81	6.07	0.82	7.38	.01
Subtest 4	13.76	499.31	13.76	1.52	9.04	.00

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 161.5.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-14

Analysis of Variance Summary Table for Attitudes (Subtests) by Knowledge of an Adolescent Mother Well (GI 14c)

Test of Significance[1]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.04	2.28	4	225	.06

F Tests[2] (1, 228)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	6.43	412.17	6.43	1.81	3.56	.06
Subtest 2	0.45	690.03	0.45	3.03	0.15	.70
Subtest 3	0.02	210.37	0.02	0.92	0.02	.89
Subtest 4	0.91	398.52	0.91	1.75	0.52	.47

Note. Subscripts: h = hypothesis; e = error.
[1]s = 1, m = 1, n = 111.5.
[2]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-15

Analysis of Variance Summary Table for Attitudes (Subtests) by Birth Order

Test of Significance[1]					
Test	Value	≈F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.02	0.41	12	945	.96

F Tests[2] (3, 316)						
Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	0.94	602.86	0.31	1.91	0.16	.92
Subtest 2	1.13	887.27	0.38	2.81	0.13	.94
Subtest 3	1.01	271.25	0.34	0.86	0.39	.76
Subtest 4	4.37	489.75	1.46	1.54	0.94	.42

Note. Subscripts: h = hypothesis; e = error.
[1]s = 3, m = 0, n = 155.5.
[2]The F tests generated by SPSS^X are univariate. Due to the large sample size, however, any effect on the ρ is minimal.

Table J-16

Analysis of Variance Summary Table for Attitudes (Subtests) by Religious Affiliation[1]

Test of Significance[2]

Test	Value	≃F	df_h	df_e	ρ
Pillais-Bartlett Trace	0.04	0.79	12	741	.66

F Tests[3] (3, 248)

Variable	SS_h	SS_e	MS_h	MS_e	F	ρ
Subtest 1	1.84	419.53	0.61	1.69	0.36	.78
Subtest 2	2.61	652.59	0.87	2.63	0.33	.80
Subtest 3	2.89	167.13	0.96	0.67	1.43	.23
Subtest 4	6.62	360.82	2.21	1.45	1.52	.21

Note. Subscripts: h = hypothesis; e = error.
[1]Groups = Protestant, Roman Catholic, "Christian", and no religious affiliation.
[2]s = 3, m = 0, n = 121.5.
[3]The F tests generated by SPSS^x are univariate. Due to the large sample size, however, any effect on the ρ is minimal.